SITE PLANNING FOR DAYLIGHT & SUNLIGHT

BALSCADDEN SHD

BRE DAYLIGHT & SUNLIGHT ASSESSMENT

BALSCADDEN SHD

REPORT ON
SITE PLANNING FOR
DAYLIGHT & SUNLIGHT

Completed By: BRIAN WYLIE
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1 Executive Summary

J.V.Tierney & Co. have been commissioned to undertake a daylight and sunlight study for the strategic housing development at Balscadden Road and Main St., Howth.

The Fingal Development Plan 2017-2023 states the following; "*Ensure all new residential units comply with the recommendations of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice*" ***(BRE (Building Research Establishment) Guidance).*** Given this, the contents of Paul Littlefair's 2011 revision of the 1991 publication Site layout planning for daylight and sunlight: a guide to good practice for the Building Research Establishment have been considered in the preparation of this report.

The BRE Guidance (See Section 2) does not set out rigid standards or limits. The BRE Guidance is preceded by the following very clear warning as to how the design advice contained therein should be used:

"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design."

The testing methodology for the Proposed Development and the surrounding properties consists of reviewing the potential impact against the following criteria:

(A) Light from the Sky
(B) Amenity Area Sunlight Analysis
(C) Loss of Sunlight
(D) Average Daylight Factor (ADF)
(E) Garden Analysis
(F) Overshadowing Assessment

This report also seeks to address the requests as made by Fingal County Council contained within their written opinion (Refer to SHD Pre-Application Consultation Request ABP-311179-21). These requests specifically relate to the following;

- A full Average Daylight Factor assessment based on the appropriate guidelines.
- Overshadowing assessment on the private amenity spaces with reference to the dwellings located along the western boundary of the subject site, i.e. Abbey Street and Main Street.

Additionally, this report seeks to address the standards as referenced within the ABP Opinion (Refer to Case Reference ABP-311179-21). The opinion specifically requests that the report *"should address the full extent of requirements of BRE209/BS2011, as applicable".* We understand that this request specifically relates to the standards, "*Site Layout Planning for Daylight and Sunlight 2011: A Guide to Good Practice, Second Edition by Paul Littlefair",* which is also known as *"BRE209/ BRE Guidance"* and "*BS 8206 – 2:2008".* Both of these standards have been taken into account in preparing this report. There is no applicable "*BS 2011"* standard for testing of daylight/ sunlight impacts.

In summary, 64 windows have been assessed for (A) Light from the Sky for the surrounding properties. The analysis indicates that all of the windows assessed meet the relevant criteria, i.e. Vertical Sky Component (VSC).

All amenity areas within the Proposed Development including the public realm were tested for (B) Amenity Area Sunlight Analysis. All areas are well in excess of the amenity area sunlight guidelines (50% of amenity area receiving two hours' worth of sunlight on the 21st of March).

In relation to (C) Loss of Sunlight, 14 windows have been tested for the surrounding properties and all windows meet the criteria.

In order to satisfy the requests as made by Fingal County Council contained within their written opinion (Refer to SHD Pre-Application Consultation Request ABP-311179-21), a full Average Daylight Factor assessment has been carried out for every habitable room within the Proposed Development in line with (D) Average Daylight Factor (ADF). The vast majority of room's meet the criteria set out in the BRE Guidelines (See Section 2) and *"BS-8206-2 2008"* (See Section 2) and are also in line with the development standards for new apartments as set out by the Department of Housing. The development has achieved an overall ADF pass rate of 99%. We have also carried out testing in line with *"IS EN 17037:2018"* and *"BS EN 17037:2018"*. A representative sample strip of apartments from ground floor to fourth floor comprising of both bedrooms and living spaces for a range of orientations has been considered for both Block B and C. The analysis indicates that Block B, as tested under the *"IS EN 17037"* standard has 8 rooms out of 33 which are below the criteria. However, when tested under the *"BS EN 17037"* standard there are no failures. These failures are around the fact that the *"IS EN 17037"* standard does not have a national annex as the *"BS EN 17037"* standard does. The *"BS EN 17037"* national annex accounts for the fact that room activities have different requirements for lighting levels. The *"IS EN 17037"* standard tests every room against the same lighting requirement regardless of the activity taking place inside the room. This leads to far more stringent testing circumstances which do not currently reflect best practice design. Block C has no failures when tested under both standards.

Testing on the gardens located along the western boundary of the site to satisfy the requirements contained with the FCC written opinion (Refer to SHD Pre-Application Consultation Request ABP-311179-21) has been carried out. This has been carried out in line with (E) Garden Analysis. The majority of overshadowing is caused by the existing topography. All assessed garden areas meet the criteria contained within the BRE Guidance. The testing criteria as stated in the BRE Guidance is as follows *"As a check, it is recommended that at least half of the amenity areas listed above should receive two hours of sunlight on 21 March"* and *"If an existing garden or open space is already heavily obstructed then any further loss of sunlight should be kept to a minimum. In this poorly sunlit case, if as a result of new development, the area which can receive two hours of direct sunlight on 21 March is reduced to less than 0.8 times its former size, this further loss of sunlight is significant. The garden or amenity area will tend to look more heavily overshadowed"*

As per the BRE Guidance, the equinox (21st of March) is used as it provides the best date to prepare shadow cast plots as it gives an average level of shadowing. This is fairest representation for shadowing from a Proposed Development. Winter time shadow plots are of limited value as the sun is very low and casts long shadows. Similarly, summertime plots give the best case causing minimum shadowing due to the suns position which can provide an unfair advantage for new buildings. The following is stated in the BRE Guidance, *"If a space is used all year round, the equinox (21 March) is the best date for which to prepare shadow plots as it gives an average level of shadowing"* and *"As an optional addition, plots for summertime (eg 21 June) may be helpful as they will show the reduced shadowing then, although it should be borne in mind that 21 June represents the best case of minimum shadow, and that shadows for the rest of the year will be longer. Conversely if winter shadows (eg 21 December) are plotted, even low buildings will cast long shadows. In a built-up area, it is common for large areas of the ground to be in shadow in December.*

An overshadowing analysis has been carried in line with (F) Overshadowing Assessment for the existing dwellings located along the western boundary of the site to satisfy the requirements contained with the FCC written opinion (Refer to SHD Pre-Application Consultation Request ABP-311179-21). This has been used to supplement the analysis carried out in (E) Garden Analysis. The analysis has concluded that the Proposed Development will have little to no impact on these houses in terms of overshadowing. Shadow cast plots with and without the Proposed Development in place are presented which indicate that all overshadowing is caused by the existing topography. Shadow cast plots have been carried out from 08.00 – 16.00 on the 21st of March. As per the BRE Guidance, the equinox (21st of March) is used as it provides the best date to prepare shadow cast plots as it gives an average level of shadowing. This is fairest representation for shadowing from a Proposed Development. Winter time shadow plots are of limited value as the sun is very low and casts long shadows. Similarly, summertime plots give the best case causing minimum shadowing due to the suns position which can provide an unfair advantage for new buildings. As the BRE Guide states, *"If a space is used all year round, the equinox (21 March) is the best date for which to prepare shadow plots as it gives an average level of shadowing"* and *"As an optional addition, plots for summertime (eg 21 June) may be helpful as they will show the reduced shadowing then, although it should be borne in mind that 21 June represents the best case of minimum shadow, and that shadows for the rest of the year will be longer. Conversely if winter shadows (eg 21 December) are plotted, even low buildings will cast long shadows. In a built-up area, it is common for large areas of the ground to be in shadow in December.*

2 Relevant Guidelines

The analysis contained within this report has been prepared based on the following guidelines;

- *Site Layout Planning for Daylight and Sunlight 2011: A Guide to Good Practice, Second Edition by Paul Littlefair (BRE 209/* ***BRE Guidance****)*

This guide is referenced in the Fingal Development Plan 2017-2023 which states that, *"High levels of daylight and sunlight provide for good levels of amenity for residents. The internal layout of residential units should be designed to maximise use of natural daylight and sunlight. Daylight and sunlight levels, as a minimum, should be in accordance with Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BRE2011) and British Standard (B.S.). 8206 Lighting for Buildings, Part 2 2008: Code of Practice for Daylighting or any update on these documents*." The purpose of the BRE Guidance is to provide advice on a buildings site plan and layout to achieve good levels of daylighting and sun lighting. The guide provides calculation methodologies which aims to assist clients, consultants and planning officials to make informed decisions on site layout to ensure no significant loss of light occurs. It should be noted that the guidance in this document should be seen as advice only and it should not constrain the design, "*The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design".* If this guidance is followed the end result is a site which is positioned and laid out in such a way which will provide adequate levels of sun lighting and daylighting while creating an ambience that will appeal to any building occupant. The testing criteria contained within this standard which has been used in the preparation of this report is detailed below;

(A) Light from the Sky – Assessed windows at existing neighbouring dwellings must achieve a VSC of >27% with the Proposed Development in place. Any window below this threshold must not have a VSC reduction of >20% when comparing the result with and without the Proposed Development in place. See Section *"5.1 (A) – Light from the Sky"* for more details.

(B) Amenity Area Sunlight Analysis – Assessed Amenity Area must achieve 2 Hours' worth of Sunlight on the 21st of March (Equinox). See Section "*5.2 (B) Amenity Area Sunlight Analysis"* for more details. This testing criteria is carried out for the Proposed Development.

(C) Loss of Sunlight – Assessed windows at existing neighbouring dwellings must achieve an APSH (Annual Probable Sunlight Hours) of >25% and >5% for the winter months. Any window below this threshold must not have a APSH or winter testing reduction of >20% when comparing the result with and without the Proposed Development in place. See Section *"5.3 (C) – Loss of Sunlight"* for more details. Additionally, any assessed windows which does not meet an APSH of >25% and >5% for the winter months must not have an annual loss greater than 4% of APSH.

(D) Average Daylight Factor (ADF) – The following ADF targets are set as follows. See Section *"5.4 (D) Average Daylight Factor (ADF)"* for more details. This testing criteria is carried out for the Proposed Development.

- Bedrooms = 1%
- Living Spaces = 1.5%
- Kitchens = 2%
- Combined kitchen/ living/ dining areas = 2%

(E) Garden Analysis – Garden areas must achieve 2 Hours' worth of Sunlight on the 21st of March (Equinox). If this threshold is not met, then gardens must not see a reduction in 0.8 times their former value, i.e. 20% reduction. See Section *"5.5 (E) Garden Analysis"* for more details. This testing criteria is carried out for the surrounding properties.

(F) Overshadowing Assessment – This is carried out to supplement the analysis carried out in (E) Garden Analysis. Shadow cast plots are provided with and without the Proposed Development in place. See Section *"5.6 (F) Overshadowing Assessment"* for more details.

Please note that the BRE Guidance makes reference to *"BS 8206-2:2008"* in relation to ADF targets. The BRE Guidance does not currently make reference to "*IS EN 17037:2018 – 'Daylight in Buildings"* or "*BS EN 17037:2018 – 'Daylight in Buildings".* The BRE Guidance is awaiting an update and it is expected that the new version of the BRE Guidance will make reference to *"EN 17037:2018".*

- *BS 8206 – 2:2008*

This guide is referenced in the Fingal Development Plan 2017-2023 which states that, *"High levels of daylight and sunlight provide for good levels of amenity for residents. The internal layout of residential units should be designed to maximise use of natural daylight and sunlight. Daylight and sunlight levels, as a minimum, should be in accordance with Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BRE2011) and British Standard (B.S.). 8206 Lighting for Buildings, Part 2 2008: Code of Practice for Daylighting or any update on these documents*." This guide describes good practice in daylighting design and presents criteria intended to enhance the well-being and satisfaction of people in buildings, recognizing that the aims of good lighting go beyond achieving minimum illumination for task performance.

The testing criteria contained within this standard that has been used in the preparation of this report is detailed below;

(D) Average Daylight Factor (ADF) – The following ADF targets are set as follows. See Section *"5.4 (D) Average Daylight Factor (ADF)"* for more details. This testing criteria is carried out for the Proposed Development.

  - Bedrooms = 1%
  - Living Spaces = 1.5%
  - Kitchens = 2%
  - Combined kitchen/ living/ dining areas = 2%

- *IS EN 17037:2018 – 'Daylight in Buildings'*

"IS EN 17037:2018" aims to ensure new buildings create spaces with significant daylight availability to provide adequate illumination to indoor surfaces and save energy for electrical bills. To do so, "*IS EN 17037:2018"* proposes two methods to assess daylight provision in all regularly occupied spaces: a calculation method based on daylight factor and cumulative daylight availability data (method 1); or, a calculation method based on the direct prediction of illuminance levels using hourly climate data (method 2). Method 1 is more akin to the daylight testing procedures that is already covered within the BRE Guidance and *"BS 8206 – 2:2008".* Method 2 has been used for this daylight analysis to provide a greater variance in testing approaches.

Method 2 is a calculation method of illuminance levels on the reference plane using climatic data for the given site and an adequate time step.

Method 2 requires a space to meet a target illuminance of 300 Lux, across 50% of the reference plane for half of the daylight hours of the year (Criteria 1). The minimum target illuminance of 100 Lux is also required across 95% of the reference plane for half of the daylight hours (Criteria 2). Both criteria must be achieved for a space to meet *"IS EN 10737:2018"*.

The testing criteria contained within this standard has been used in the Average Daylight Factor (ADF) analysis. See Section *"5.4 (D) Average Daylight Factor (ADF)"* for more details. This testing criteria is carried out for the Proposed Development.

- *BS EN 17037:2018 – 'Daylight in Buildings'*

The British adoption of the European standard (*"BS EN 17037:2018"*) has produced a national annex which gives more appropriate daylight targets for applicability within residential schemes. Utilising the same calculation method (method 2), the below daylight levels are considered to be more in line with the BRE Guidance and *"BS 8206 – 2:2008".*

  - Bedrooms = 100 Lux across 50% of the area of the room
  - Living Space = 150 Lux across 50% of the area of the room
  - Kitchens = 200 Lux across 50% of the area of the room

As with the BRE Guidance and *"BS 8206 – 2: 2008",* where one rooms serves more than one purpose, the minimum daylight target of the room type with the highest value has been applied. An example of this is where a space combines a kitchen and living area, the minimum daylight target is 200 Lux across 50% of the area of the room. The testing criteria contained within this standard has been used in the Average Daylight Factor (ADF) analysis. See Section *"5.4 (D) Average Daylight Factor (ADF)"* for more details. This testing criteria is carried out for the Proposed Development.

- *Sustainable Urban Housing: Design Standards for New Apartments 2020*

These guidelines set out minimum standards for apartment development, mainly in response to circumstances that had arisen whereby some local authority standards were at odds with national guidance. This standard specifically outlines that, *"Planning authorities should have regard to quantitative performance approaches to daylight provision outlines in guides BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision"*. Additionally, the guide also outlines that the applicant should provide compensatory design solutions where they cannot fully meet all of the requirements of the daylight provisions, *"Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific. This may arise due to a design constraint associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution."* The contents of this standard have been used in the Average Daylight Factor (ADF) analysis. See Section *"10.1 Average Daylight Factor Developed Design"* for more details.

2.1 Applying the Guidelines

It must be borne in mind that some degree of flexibility has to be allowed when applying the above standards, particularly in reference to urban generation. It should be expected that it is not always possible to meet the above standards especially when trying to achieve all planning objectives in the wider context.

Comments in relation to overshadowing from the BRE Guidance state that some degree of overshadowing is to be expected. The guide states that, *"It must be borne in mind that nearly all structures will create areas of new shadow, and some degree of transient overshadowing of a space is to be expected"* [(i)]. The guide also clearly states the following in terms application, *"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of the many factors in site layout design".*

The *"Urban Design Manual, A Best Practice Guide, 2009"* [(iii)] states that it may not always be possible to meet the criteria within *"Site Layout Planning for Daylight and Sunlight" (BRE209/ BRE Guidance)* [(i)] for urban areas. *"Where design standards are to be used (such as the UK document Site Layout Planning for Daylight and Sunlight, published by the BRE), it should be acknowledged that for higher density proposals in urban areas it may not be possible to achieve the specified criteria, and standards may need to be adjusted locally to recognise the need for appropriate heights or street widths"* [(iii)].

References

(i) Site Layout Planning for Daylight and Sunlight 2011: A Guide to Good Practice, Second Edition by Paul Littlefair (BRE 209/ BRE Guidance)

(ii) Site Layout Planning for Daylight and Sunlight 1991: A Guide to Good Practice by Paul Littlefair

(iii) Urban Design Manual, A Best Practice Guide, May 2009 as issued by The Department of Environment, Heritage and Local Government

3 Glossary

VSC - Vertical Sky Component. This is the ratio of the direct sky illuminance falling on the vertical wall at a reference point (usually the centre of the window), to the simultaneous horizontal illuminance under an unobstructed sky that is received from a CIE overcast sky. This term is related to the analysis contained within Section 5.1, *"(A) Light from the Sky"*

CIE - The standard CIE (Commission Internationale de L'Eclairage – International Commission on Illumination) overcast sky. The CIE Overcast sky is intended for two purposes; to be a universal basis for the classification of measured sky luminance distributions and to give a method for calculating sky luminance in daylighting design procedures. This term is related to the analysis contained within Section 5.1, *"(A) Light from the Sky"* and Section 5.4, "*(D) Average Daylight Factor."*

APSH – Annual Probable Sunlight Hours. Here "probable sunlight hours" means the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question. This term is related to the analysis contained within Section 5.3, *"(C) Loss of Sunlight"*

ADF – Average Daylight Factor. This is the ratio of total daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE Standard Overcast Sky. This term is related to the analysis contained within Section 5.4, "*(D) Average Daylight Factor."*

BRE – Building Research Establishment. The BRE is a profit for purpose organisation who generate new knowledge through independent research. This is used to create the products, standards and qualifications that help make sure that buildings, homes and communities are safe, efficient, productive, sustainable and enjoyable places to be.

4 Introduction

The proposed development relates to lands located to the south of the Martello Tower on Balscadden Road & the former Baily Court Hotel, Main Street, Howth, County Dublin. The development will consist of the demolition of existing structures on the proposed site including the disused sports building and the former Baily Court Hotel buildings and the construction of a residential development set out in 4 no. residential blocks, ranging in height from 2 to 5 storeys to accommodate 180 no. apartments with associated internal residential tenant amenity and external courtyards and roof terraces, 1 no. retail unit and 2 no. café/retail units. The site will accommodate car parking spaces at basement level and bicycle parking spaces at basement and surface level. Landscaping will include new linear plaza which will create a new pedestrian link between Main St and Balscadden Rd to include the creation of an additional 2 no. new public plazas and also maintains and upgrades the pedestrian link from Abbey Street to Balscadden Road below the Martello Tower. Please see the accompanying Statutory Notices for a more detailed description.

5 Methodology

A 3D geometric model of the site was created using software IES-VE and using Revit Models issued by Plus Architecture. Calculations will be carried out for both the proposed and existing development. The selection of assessment points is based on proximation and orientation of surrounding residential properties towards the Proposed Development. The procedure takes into account the following sun lighting and daylighting calculation methodologies used when assessing a site; (A) Light from the Sky, (B) Amenity Area Sunlight Analysis, (C) Loss of Sunlight, (D) Average Daylight Factor (ADF), (E) Garden Analysis and (F) Overshadowing Assessment. These assessment methodologies are explained below.

Figure 1 - Site Plan of Buildings

5.1 (A) Light from the Sky

This assessment methodology is used for the surrounding properties and is explained below;

This assessment methodology is for vertical windows and is called the *"Vertical Sky Component (VSC)".* This is the ratio of the direct sky illuminance falling on the vertical wall at a reference point (usually the centre of the window), to the simultaneous horizontal illuminance under an unobstructed sky. The standard CIE (Commission Internationale de L'Eclairage – International Commission on Illumination) overcast sky is used. The CIE Overcast sky is intended for two purposes; to be a universal basis for the classification of measured sky luminance distributions and to give a method for calculating sky luminance in daylighting design procedures. The following steps contained within the BRE Guidance are used to carry out this methodology;

(A) If the VSC's with the new development in place are greater than 27%, then enough skylight should still be reaching the windows of the existing building. No further analysis needs to be carried out for these windows.
(B) The existing VSC's are then determined for any of the windows which are below 27%.
(C) If the VSC's, with the new development in place, are both less than 27% and less than 0.8 times their former value, (i.e.20% reduction) for the remainder of the windows, occupants of the existing building will notice a reduction in the amount of skylight.

The above testing criteria is contained within the BRE Guidance and is stated as follows, *"If this VSC is greater than 27% then enough skylight should still be reaching the window of the existing building. Any reduction below this level should be kept to a minimum. If the VSC, with the new development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight. The area lit by the window is likely to appear more gloomy, and electric lighting will be needed more of the time".* This testing criteria is carried out for the existing neighbouring dwellings.

An additional point of testing under this methodology is the *"no sky line"* testing criteria. This testing criteria gives an indication of how much of the sky can be seen in a room. This can only be carried out when room layouts are known as stated in the BRE Guidance, *"Where room layouts are known, the impact on the daylighting distribution in the existing building can be found by plotting the "no sky line" in each of the main rooms. For houses this would include living rooms, dining rooms and kitchens; bedrooms should also be analysed although they are less important.* As room layouts of the existing dwellings are unknown, this testing criteria cannot be carried out. The VSC analysis above (A, B and C) is generally accepted as standard industry practice.

5.2 (B) Amenity Area Sunlight Analysis

While providing good levels of daylight and sunlight in living spaces is important, it is also essential to apply the same mentality to outside spaces and amenity areas. An adequately lit open space creates a rich ambience that any occupant would find appealing.

The basis of this calculation is to assess if 50% of the amenity area will achieve more than two hours' worth of sunlight during the equinox (21st March). As per the BRE Guidance, the equinox (21st of March) is used as it provides the best date to prepare shadow cast plots as it gives an average level of shadowing. This is fairest representation for shadowing from a Proposed Development. Winter time

shadow plots are of limited value as the sun is very low and casts long shadows. Similarly, summertime plots give the best case causing minimum shadowing due to the suns position which can provide an unfair advantage for new buildings. The following is stated in the BRE Guidance, *"If a space is used all year round, the equinox (21 March) is the best date for which to prepare shadow plots as it gives an average level of shadowing"* and *"As an optional addition, plots for summertime (eg 21 June) may be helpful as they will show the reduced shadowing then, although it should be borne in mind that 21 June represents the best case of minimum shadow, and that shadows for the rest of the year will be longer. Conversely if winter shadows (eg 21 December) are plotted, even low buildings will cast long shadows. In a built-up area, it is common for large areas of the ground to be in shadow in December.* This testing criteria is carried out for the Proposed Development.

The above testing criteria is contained within the BRE Guidance and is stated as follows, *"As a check, it is recommended that at least half of the amenity areas listed above should receive at least two hours of sunlight on 21 March".*

5.3 (C) Loss of Sunlight

When designing a new development, careful consideration should be taken to safeguard access to sunlight for any nearby buildings. As stated in BRE Guidance*, "people are particularly likely to notice a loss of sunlight to their homes and if it is extensive then it will usually be resented".*

To assess loss of sunlight to a property, consideration should only be taken to any window facing within 90° of due south. Any windows which face outside of 90° of due south have much less access to sunlight and are less likely to be impacted. Main living rooms and conservatories should be assessed but the BRE Guidance indicates that bedrooms and kitchens are less important, although care should be taken not to block too much sun. The following steps contained within the BRE Guidance are used to carry out this methodology;

(A) If the centre of a window facing within 90° of due south can receive more than a quarter (25%) of APSH (Annual Probable Sunlight Hours), including at least 5% of APSH in the winter months between the 21st of September and the 21st of March, then the room should still receive enough sunlight. No further analysis needs to be carried out for these windows. If either the annual (APSH) or winter sunlight hours are below the criteria, then the analysis moves onto step B - D.

(B) The existing values are then determined for any of the windows which are below the above thresholds.

(C) If the available sunlight hours are both less than the amount above and less than 0.8 times their formal value (i.e. 20% reduction) either over the whole year (APSH) or just in the winter months (21st September to 21st March), then the occupants of the existing building will notice the loss of sunlight.

(D) Additionally, if the overall annual loss is greater than 4% of APSH, the room may appear colder and less cheerful and pleasant. This is carried out for any window that does not achieve the thresholds as set out in (A) above.

Here *"probable sunlight hours"* means the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question. This testing criteria is carried out for the existing neighbouring dwellings.

The above testing criteria is contained within the BRE Guidance and is stated as follows, *"If this window point can receive more than one quarter of APSH, including at least 5% of APSH in the winter months between 21 September and 21 March, then the room should still receive enough sunlight", "Any reduction in sunlight access below this level should be kept to a minimum. If the available sunlight*

hours are both less than the amount above and less than 0.8 times their former value, either over the whole year or just in the winter months (21 September to 21 March), then the occupants of the existing building will notice the loss of sunlight; If the overall annual loss is greater than 4% of APSH, the room may appear colder and less cheerful and pleasant" and *"To asses loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings, and conservatories, should be checked and if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun."*

5.4 (D) Average Daylight Factor (ADF)

In order to assess the quality of daylight enjoyed within the Proposed Development, an Average Daylight Factor (ADF) calculation was used. The Average Daylight Factor (ADF) is a ratio between indoor illuminance and outdoor illuminance expressed as a percentage. The ADF targets for both bedrooms and combined kitchen/ living/ dining areas are as per the BRE Guidance and *"BS 8206 – 2:2008".* The ADF targets are set as follows;

- Bedrooms = 1%
- Living Space = 1.5%
- Kitchen = 2%
- Combined kitchen/ living/ dining areas = 2%

The above testing criteria is contained within the BRE Guidance and is stated as follows, *"In housing BS 8206-2 also gives minimum values of ADF of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms".* Additionally, the testing criteria for combined kitchen/ living/ dining areas is contained within "*BS 8206-2 2008"* and is stated as follows, *"Where one room serves more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example, in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%."*

Further testing has been carried out in line with *"IS EN 17037:2018"*. This standard aims to ensure new buildings create spaces with significant daylight availability to provide adequate illumination to indoor surfaces and save energy for electrical bills. To do so, *"IS EN 17037:2018"* proposes two methods to assess daylight provision in all regularly occupied spaces: a calculation method based on daylight factor and cumulative daylight availability data (method 1); or, a calculation method based on the direct prediction of illuminance levels using hourly climate data (method 2). Method 1 is more akin to the daylight testing procedures that is already covered within the BRE Guidance and *"BS 8206 – 2:2008".* Method 2 has been used for this daylight analysis to provide a greater variance in testing approaches.

Method 2 requires a space to meet a target illuminance of 300 Lux, across 50% of the reference plane for half of the daylight hours of the year (Criteria 1). The minimum target illuminance of 100 Lux is also required across 95% of the reference plane for half of the daylight hours (Criteria 2). Both criteria must be achieved for a space to meet *"IS EN 10737:2018"*.

Testing has also been carried out in line with the British adoption of the European standard, *"BS EN 17037:2018"*. This standard has produced a national annex which gives more appropriate daylight targets for applicability within residential schemes. Utilising the same calculation method (method 2), the below daylight levels are considered to be more in line with the BRE Guidance and *"BS 8206 – 2:2008".*

- Bedrooms = 100 Lux across 50% of the area of the room
- Living Space = 150 Lux across 50% of the area of the room
- Kitchens = 200 Lux across 50% of the area of the room

As with the BRE Guidance and *"BS 8206 – 2:2008"* where one rooms serves more than one purpose, the minimum daylight target of the room type with the highest value has been applied. An example of this is where a space combines a kitchen and living area the minimum daylight target is 200 Lux across 50% of the area of the room.

The assessment of Average Daylight Factors (ADF) is based on the following parameters;

- Site Layout
- Building Form
- Surrounding Structures
- Separation Distances
- Room Depths
- Window size
- Balconies

Every habitable room in every Block has been tested in accordance with the BRE Guidance and *"BS 8206 – 2:2008".* A sample of rooms in Block B and C has been tested in accordance with *"IS EN 10737:2018"* and *"BS EN 17037:2018"*.

5.5 (E) Garden Analysis

While providing good levels of daylight and sunlight in living spaces is important, it is also essential to apply the same mentality to outside spaces and amenity areas. An adequately lit garden or open space creates a rich ambience that any occupant would find appealing. A well-lit garden or open space will add value to a property so it is essential that careful consideration is taken when assessing these spaces. This has been carried on the private amenity spaces with reference to the dwellings located along the western boundary of the subject site, i.e. Abbey Street and Main Street to satisfy the requirements contained with the FCC written opinion (Refer to SHD Pre-Application Consultation Request ABP-311179-21).

The following steps contained within the BRE Guidance are used to carry out this methodology;

(A) If the garden areas with the new development in place receives two hours' worth of sunlight on 50% of the garden during the equinox (21st of March), then the gardens meet the criteria contained within the BRE Guidance.
(B) If the garden areas do not meet the criteria in (A) above, then the analysis determines the area of garden that does receive two hours' worth of sunlight on the equinox (21st of March) on the existing site, i.e. without the Proposed Development in place.
(C) If the garden areas, with the new development in place, are both less than criteria (A) and less than 0.8 times their former value, (i.e. 20% reduction) the loss of sunlight will be significant.

The above criteria are stated in the BRE Guidance as follows; *"As a check, it is recommended that at least half of the amenity areas listed above should receive two hours of sunlight on 21 March"* and *"If an existing garden or open space is already heavily obstructed then any further loss of sunlight should be kept to a minimum. In this poorly sunlit case, if as a result of new development, the area which can receive two hours of direct sunlight on 21 March is reduced to less than 0.8 times its former size, this further loss of sunlight is significant. The garden or amenity area will tend to look more heavily overshadowed"*

As per the BRE Guidance, the equinox (21st of March) is used as it provides the best date to prepare shadow cast plots as it gives an average level of shadowing. This is fairest representation for shadowing from a Proposed Development. Winter time shadow plots are of limited value as the sun is very low and casts long shadows. Similarly, summertime plots give the best case causing minimum

shadowing due to the suns position which can provide an unfair advantage for new buildings. The following is stated in the BRE Guidance, *"If a space is used all year round, the equinox (21 March) is the best date for which to prepare shadow plots as it gives an average level of shadowing"* and *"As an optional addition, plots for summertime (eg 21 June) may be helpful as they will show the reduced shadowing then, although it should be borne in mind that 21 June represents the best case of minimum shadow, and that shadows for the rest of the year will be longer. Conversely if winter shadows (eg 21 December) are plotted, even low buildings will cast long shadows. In a built-up area, it is common for large areas of the ground to be in shadow in December.*

5.6 (F) Overshadowing Assessment

An overshadowing analysis has been carried on the private amenity spaces with reference to the dwellings located along the western boundary of the subject site, i.e. Abbey Street and Main Street to satisfy the requirements contained with the FCC written opinion (Refer to SHD Pre-Application Consultation Request ABP-311179-21). This is carried out to supplement the analysis carried out in (E) Garden Analysis and is caried out in line with the BRE Guidance which states the following, *"Where there are existing buildings as well as the proposed one, "before" and "after" shadow plots showing the difference that the proposed building makes may be helpful. In interpreting the impact of such differences, it must be borne in mind that nearly all structures will create areas of new shadow, and some degree of transient overshadowing of a space is to be expected".* Shadow cast plots with and without the Proposed Development in place are presented to highlight any potential overshadowing impact that the Proposed Development may have. Shadow cast plots have been carried out from 08.00 – 16.00 on the 21st of March. As per the BRE Guidance, the equinox (21st of March) is used as it provides the best date to prepare shadow cast plots as it gives an average level of shadowing. This is fairest representation for shadowing from a Proposed Development. Winter time shadow plots are of limited value as the sun is very low and casts long shadows. Similarly, summertime plots give the best case causing minimum shadowing due to the suns position which can provide an unfair advantage for new buildings. The following is stated in the BRE Guidance, *"If a space is used all year round, the equinox (21 March) is the best date for which to prepare shadow plots as it gives an average level of shadowing"* and *"As an optional addition, plots for summertime (eg 21 June) may be helpful as they will show the reduced shadowing then, although it should be borne in mind that 21 June represents the best case of minimum shadow, and that shadows for the rest of the year will be longer. Conversely if winter shadows (eg 21 December) are plotted, even low buildings will cast long shadows. In a built-up area, it is common for large areas of the ground to be in shadow in December.*

6 Summary of Areas to be Assessed

Please see below a summary of areas to be assessed. The selection of assessment points is based on proximation and orientation of surrounding residential properties towards the Proposed Development.

i. Library

This is a single-story building located to the south of the Proposed Development. It will only be assessed for (A) Light from the Sky. It will not be assessed for (B) Amenity Area Sunlight Analysis or (D) Average Daylight Factor as these methodologies are used for testing the Proposed Development only. It will be not be assessed for (C) Loss of Sunlight as the assessed windows are not within 90° of due south. Please see statement from the BRE Guidance referenced below.

> "*To assess loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90° of due south".*

It will not be assessed for (E) Garden Analysis as the Proposed development is orientated north of the library and will therefore have no impact on it.

It will be not be assessed for (F) Overshadowing Assessment as the Proposed development is orientated north of the library and will therefore have no impact on it.

Figure 2 - Library

ii. 1-6 Emo House to 13 Abbey Street

These are a row of terraced houses which run along Main St./Abbey St. to the west of the Proposed Development. Please note that information surrounding these properties is very limited. J.V.Tierney & Co. attended site to ascertain the number of windows, along with their positioning and the extent of garden areas associated with these houses. It was observed on site that there was high levels of trees, hedges and topography surrounding these properties. It was not possible to view the properties due to trees, hedges and topography. Additionally, other sources of information such as Google Earth provided little information around the existence of windows or size/ dimensions/ levels of gardens. Google Earth along with our site visit photography (See Appendix B) highlights the above information and the extent of the surrounding trees, hedges and topography.

Therefore, we have assumed a large range of assumed assessment points for (A) Light from the Sky for each property which comprises of both high and low-level windows evenly spread across a number of points along each property's façade which face the Proposed Development. We have therefore taken a worst-case approach by assessing these assumed windows. See Figure 4 for window references.

We have carried out (E) Garden Analysis based on assumed size/ dimension/ level of garden for each of these houses to satisfy the requirements contained with the FCC written opinion (Refer to SHD Pre-Application Consultation Request ABP-311179-21). The assumed garden area does not include for overshadowing impacts from existing surrounding fences/ walls which would separate neighbouring properties from one another. The analysis also does not include for overshadowing impacts from existing surrounding trees, hedges or sheds within gardens. The analysis has removed any additional overshadowing impact from existing fences/ walls, trees, hedges and sheds and has presented results for the amount of sunlight reaching each of the assumed gardens (50% of garden achieving 2 Hours' worth of sunlight during the equinox) with and without the Proposed Development in place. This presents any perceived impact from the Proposed Development in its purest form and accounts for the worst-case scenario given the lack of available information for these houses. The modelling of topography has been based on survey information. This survey information did not include any information about the gardens associated with these houses. Therefore, all reasonably practical steps have been taken to carry out this analysis. Please see garden references used for analysis in Figure 5 below.

In addition to (E) Garden Analysis above, we have further supplemented the testing for the garden areas of these houses by providing shadow cast plots in line with (F) Overshadowing Assessment. This has been carried for these houses to satisfy the requirements contained with the FCC written opinion (Refer to SHD Pre-Application Consultation Request ABP-311179-21).

These houses will not be assessed for (B) Amenity Area Sunlight Analysis or (D) Average Daylight Factor as these methodologies are used for testing the Proposed Development only. Only 13 Abbey Street and the two south east facing windows on 1-6 Emo House will be assessed for (C) Loss of Sunlight as the assessed windows are within 90° of due south. Please see statement from the BRE Guidance referenced below.

> "*To assess loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90° of due south".*

Figure 3 – 1-6 Emo House to 13 Abbey Street

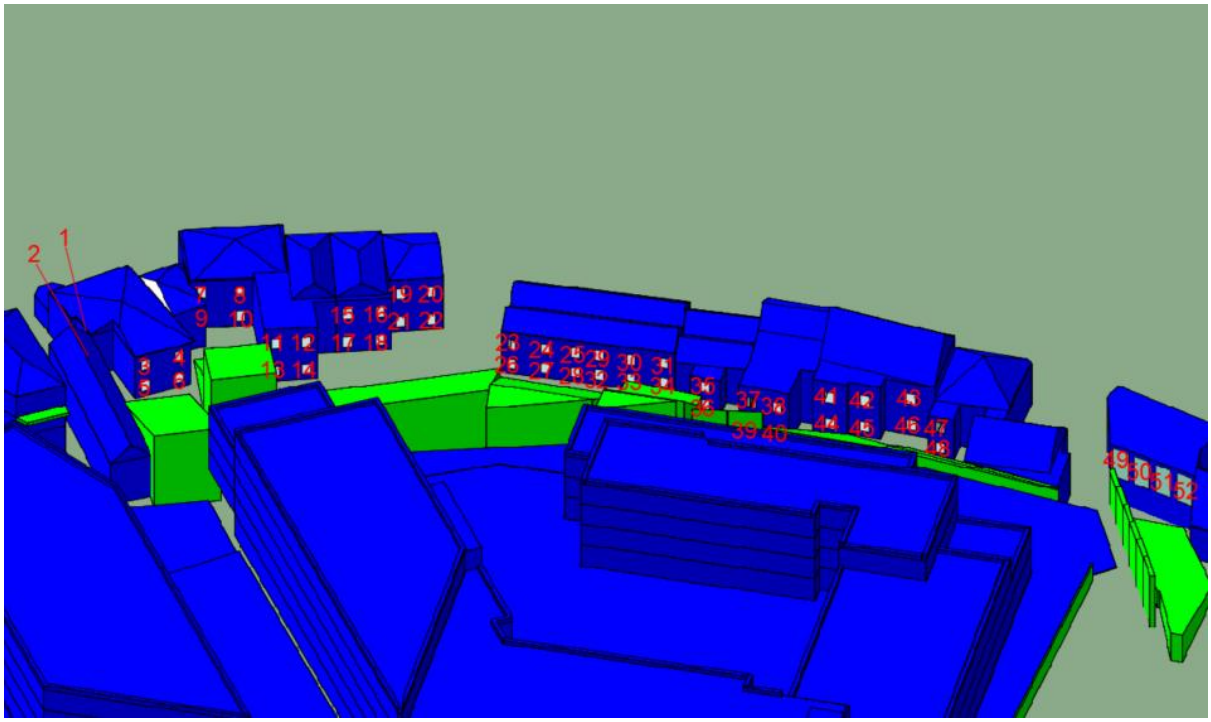

Figure 4 - (A) Light from the Sky Window References 1-6 Emo House to 13 Abbey Street looking west from the Proposed Development

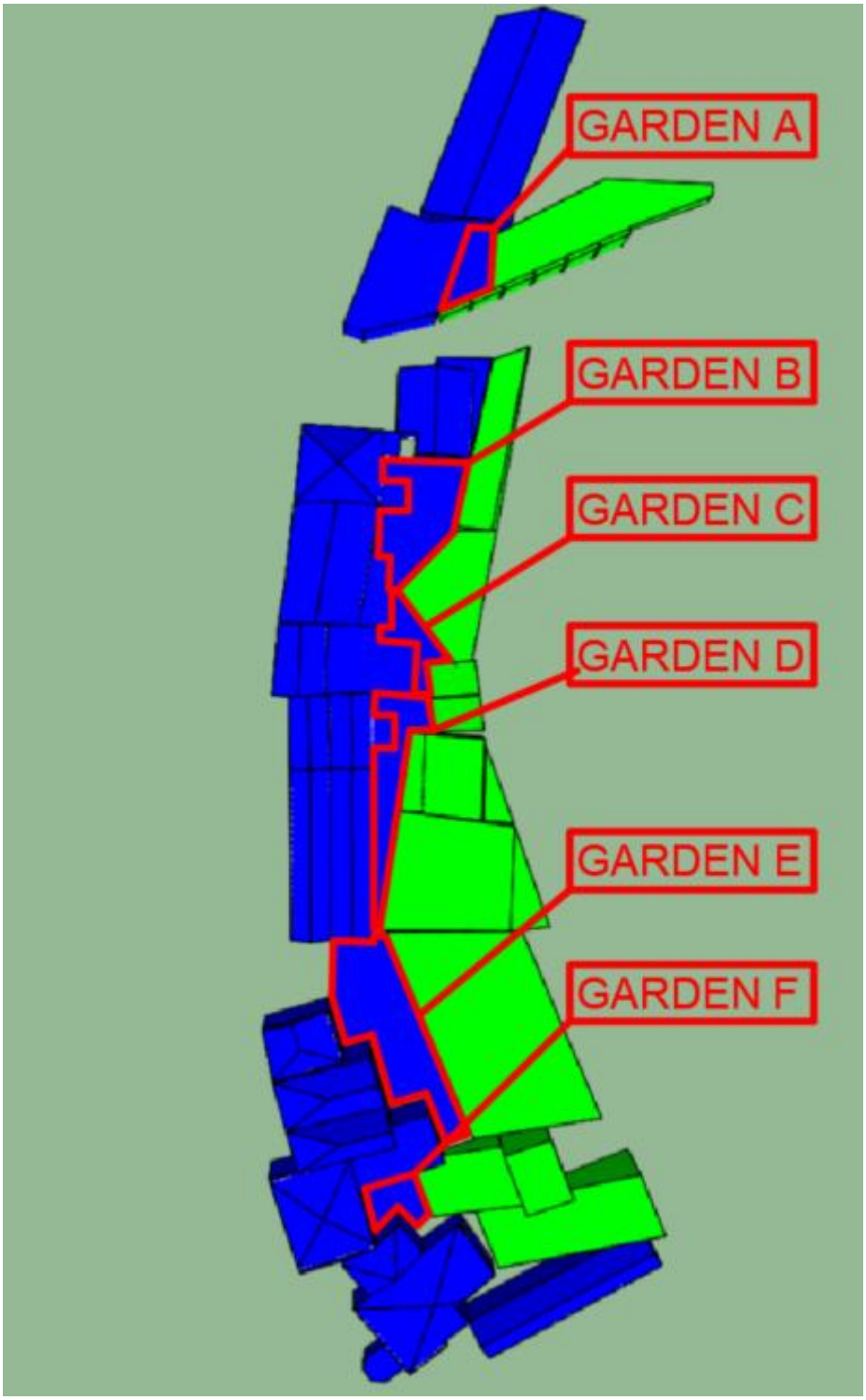

Figure 5 - (E) Garden Analysis References 1-6 Emo House to 13 Abbey Street

iii. Asgard Apartments

This is a development known as Asgard Apartments comprising 17 apartments, which runs to the east of the development along Balscadden Road. None of these residential units will be assessed under any of the methodologies as they are already heavily obstructed by existing topography. The Proposed Development will have no impact on these residential units.

Figure 6 – Asgard Apartments

iv. 6 Balscadden Road to 13 Balscadden Road

These are a row of terraced houses which run along the east of the Proposed Development at Balscadden Road. These properties will be assessed for (A) Light from the Sky. See Figure 8 for window references. They will not be assessed for (B) Amenity Area Sunlight Analysis or (D) Average Daylight Factor as these methodologies are used for testing the Proposed Development only. 7 – 13 Balscadden Road will be assessed for (C) Loss of Sunlight as the assessed windows are within 90° of due south. 6 Balscadden Road is omitted from this testing methodology as the windows are not within 90° of due south.

> "*To assess loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90° of due south".*

Please note that none of the individual gardens will be assessed for (E) Garden Analysis as the gardens are orientated away from the Proposed Development and will not be impacted by it.

It will be not be assessed for (F) Overshadowing Assessment as the gardens are orientated away from the Proposed Development and will not be impacted by it.

Figure 7 – 6 Balscadden Road to 13 Balscadden Road

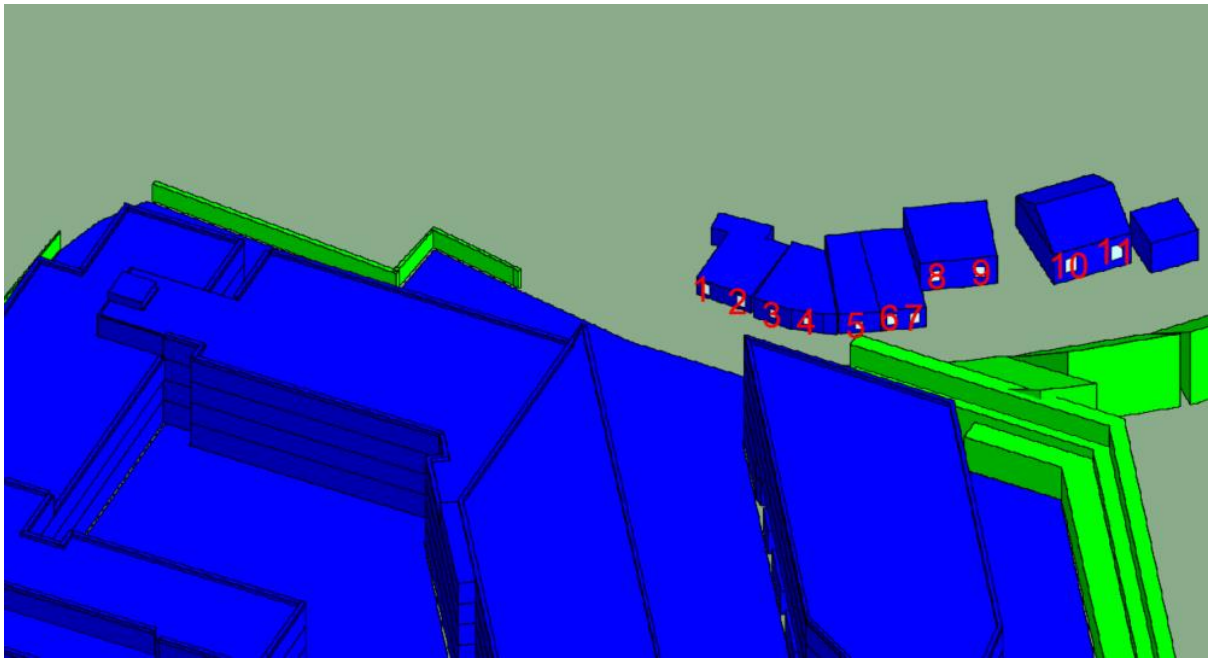

Figure 8 – (A) Light from the Sky Window References 6 Balscadden Road to 13 Balscadden Road

v. Asgard Park

These are a number of detached houses located in a cul de sac called Asgard Park which run along the south of the Proposed Development. None of these houses will be assessed under any of the methodologies as they are situated at a much higher level than the Proposed Development. The Proposed Development will have no impact on these houses.

Figure 9 – Asgard Park

vi. Proposed Development

The Proposed Development consists of 4 blocks of residential units made up of living areas, kitchens, bedrooms, toilets, studies, circulation areas, toilets and plant areas.

It will be assessed for (B) Amenity Area Sunlight Analysis. All relevant areas within these blocks will be assessed for (D) Average Daylight Factor (ADF). It will not be assessed for (A) Light from the Sky, (C) Loss of Sunlight, (E) Garden Analysis or (F) Overshadowing Assessment as these methodologies are used for testing the surrounding properties only.

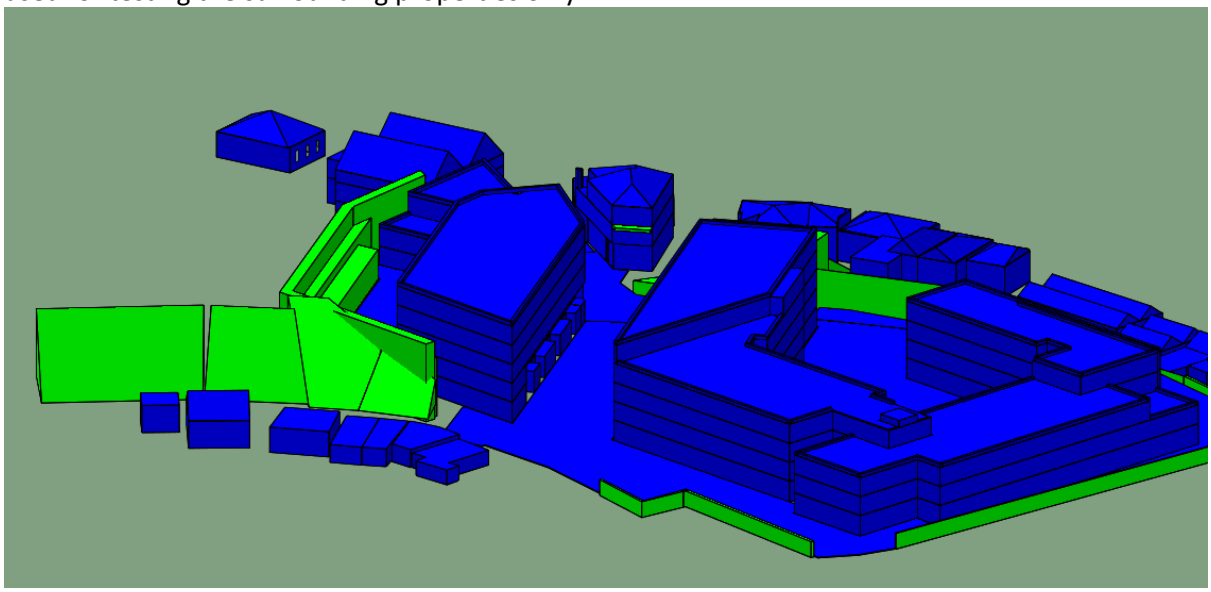

Figure 10 – View from Balscadden Road of Proposed Development

7 (A) Light from the Sky Results

The below testing criteria is contained within the BRE Guidance and is stated as follows, *"If this VSC is greater than 27% then enough skylight should still be reaching the window of the existing building. Any reduction below this level should be kept to a minimum. If the VSC, with the new development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight. The area lit by the window is likely to appear more gloomy, and electric lighting will be needed more of the time".* Please read results in conjunction with Section *"5.1 (A) Light from the Sky".* This section explains the steps taken (A, B and C) as annotated in the results table below.

Table 1 - Light from the Sky Results

General Information	Criteria						Overal Status
House Name	A			B	C		
	If the VSC's with the new development in place are greater than 27%, then enough skylight should still be reaching the windows of the existing building. No further analysis needs to be carried out for these windows.			The existing VSC's are then determined for any of the windows which are below 27%, i.e. which do not meet the criteria in (A)	If the VSC's, with the new development in place, are both less than 27% and less than 0.8 times their former value, (i.e.20% reduction) for the remainder of the windows, occupants of the existing building will notice a reduction in the amount of skylight.		
	BRE Target [%]	Proposed Vertical Sky Component [%]	Status	Existing Vertical Sky Component [%]	BRE Reduction Target [%]	Reduction [%]	
Library	>27	31.98	Meets Criteria	NA	NA	NA	Meets Criteria
1 - 6 Emo House Window 1	>27	21.79	Below Criteria	23.46	<20	7.12	Meets Criteria
1 - 6 Emo House Window 2	>27	16.86	Below Criteria	18.18	<20	7.26	Meets Criteria
1 - 6 Emo House Window 3	>27	24.36	Below Criteria	27.74	<20	12.18	Meets Criteria
1 - 6 Emo House Window 4	>27	24.64	Below Criteria	26.71	<20	7.75	Meets Criteria
1 - 6 Emo House Window 5	>27	18.81	Below Criteria	20.16	<20	6.70	Meets Criteria
1 - 6 Emo House Window 6	>27	16.38	Below Criteria	17.51	<20	6.45	Meets Criteria
24 Abbey Street Window 7	>27	22.14	Below Criteria	22.48	<20	1.51	Meets Criteria
24 Abbey Street Window 8	>27	23.1	Below Criteria	25.06	<20	7.82	Meets Criteria
24 Abbey Street Window 9	>27	10.49	Below Criteria	10.78	<20	2.69	Meets Criteria
24 Abbey Street Window 10	>27	15.04	Below Criteria	15.74	<20	4.45	Meets Criteria
23 Abbey Street Window 11	>27	25.62	Below Criteria	28.48	<20	10.04	Meets Criteria
23 Abbey Street Window 12	>27	27.13	Meets Criteria	NA	NA	NA	Meets Criteria
23 Abbey Street Window 13	>27	17.76	Below Criteria	18.98	<20	6.43	Meets Criteria
23 Abbey Street Window 14	>27	21.39	Below Criteria	23.27	<20	8.08	Meets Criteria
22 Abbey Street Window 15	>27	29.83	Meets Criteria	NA	NA	NA	Meets Criteria
22 Abbey Street Window 16	>27	31.43	Meets Criteria	NA	NA	NA	Meets Criteria
22 Abbey Street Window 17	>27	23.72	Below Criteria	25.45	<20	6.80	Meets Criteria
22 Abbey Street Window 18	>27	26.17	Below Criteria	28.8	<20	9.13	Meets Criteria
21 Abbey Street Window 19	>27	26.47	Below Criteria	28.44	<20	6.93	Meets Criteria
21 Abbey Street Window 20	>27	31.83	Meets Criteria	NA	NA	NA	Meets Criteria
21 Abbey Street Window 21	>27	20.63	Below Criteria	21.86	<20	5.63	Meets Criteria
21 Abbey Street Window 22	>27	25.66	Below Criteria	28.08	<20	8.62	Meets Criteria
20 Abbey Street Window 23	>27	28.07	Meets Criteria	NA	NA	NA	Meets Criteria
20 Abbey Street Window 24	>27	27.86	Meets Criteria	NA	NA	NA	Meets Criteria
20 Abbey Street Window 25	>27	27.9	Meets Criteria	NA	NA	NA	Meets Criteria
20 Abbey Street Window 26	>27	24.52	Below Criteria	25.96	<20	5.55	Meets Criteria
20 Abbey Street Window 27	>27	24.47	Below Criteria	24.93	<20	1.85	Meets Criteria
20 Abbey Street Window 28	>27	24.05	Below Criteria	24.08	<20	0.12	Meets Criteria
19 Abbey Street Window 29	>27	28.15	Meets Criteria	NA	NA	NA	Meets Criteria
19 Abbey Street Window 30	>27	27.95	Meets Criteria	NA	NA	NA	Meets Criteria
19 Abbey Street Window 31	>27	27.74	Meets Criteria	NA	NA	NA	Meets Criteria
19 Abbey Street Window 32	>27	23.78	Below Criteria	24.31	<20	2.18	Meets Criteria
19 Abbey Street Window 33	>27	23.4	Below Criteria	23.44	<20	0.17	Meets Criteria
19 Abbey Street Window 34	>27	22.05	Below Criteria	22.05	<20	0.00	Meets Criteria

18 Abbey Street Window 35	>27	24.32	Below Criteria	26.47	<20	8.12	Meets Criteria
18 Abbey Street Window 36	>27	14	Below Criteria	14.06	<20	0.43	Meets Criteria
17/16 Abbey Street Window 37	>27	23.52	Below Criteria	25.7	<20	8.48	Meets Criteria
17/16 Abbey Street Window 38	>27	23.61	Below Criteria	27.37	<20	13.74	Meets Criteria
17/16 Abbey Street Window 39	>27	13.5	Below Criteria	13.57	<20	0.52	Meets Criteria
17/16 Abbey Street Window 40	>27	13.5	Below Criteria	13.5	<20	0.00	Meets Criteria
15 Abbey Street Window 41	>27	25.15	Below Criteria	31.32	<20	19.70	Meets Criteria
15 Abbey Street Window 42	>27	26.49	Below Criteria	32.18	<20	17.68	Meets Criteria
15 Abbey Street Window 43	>27	26.58	Below Criteria	32.13	<20	17.27	Meets Criteria
15 Abbey Street Window 44	>27	18.84	Below Criteria	20.09	<20	6.22	Meets Criteria
15 Abbey Street Window 45	>27	21.12	Below Criteria	22.93	<20	7.89	Meets Criteria
15 Abbey Street Window 46	>27	18.91	Below Criteria	20.29	<20	6.80	Meets Criteria
14 Abbey Street Window 47	>27	23.61	Below Criteria	26.67	<20	11.47	Meets Criteria
14 Abbey Street Window 48	>27	18.18	Below Criteria	18.97	<20	4.16	Meets Criteria
13 Abbey Street Window 49	>27	31.15	Meets Criteria	NA	NA	NA	Meets Criteria
13 Abbey Street Window 50	>27	31.97	Meets Criteria	NA	NA	NA	Meets Criteria
13 Abbey Street Window 51	>27	32.51	Meets Criteria	NA	NA	NA	Meets Criteria
13 Abbey Street Window 52	>27	31.07	Meets Criteria	NA	NA	NA	Meets Criteria
6 Balscadden Road Window 1	>27	29.44	Meets Criteria	NA	NA	NA	Meets Criteria
6 Balscadden Road Window 2	>27	28.49	Meets Criteria	NA	NA	NA	Meets Criteria
7 Balscadden Road Window 3	>27	26.79	Below Criteria	31.65	<20	15.36	Meets Criteria
7 Balscadden Road Window 4	>27	24.56	Below Criteria	29.45	<20	16.60	Meets Criteria
8 Balscadden Road Window 5	>27	23.44	Below Criteria	28.39	<20	17.44	Meets Criteria
8 Balscadden Road Window 6	>27	24.82	Below Criteria	28.4	<20	12.61	Meets Criteria
8 Balscadden Road Window 7	>27	25.27	Below Criteria	28.54	<20	11.46	Meets Criteria
9 Balscadden Road Window 8	>27	29.93	Meets Criteria	NA	NA	NA	Meets Criteria
9 Balscadden Road Window 9	>27	30.36	Meets Criteria	NA	NA	NA	Meets Criteria
13 Balscadden Road Window 10	>27	30.71	Meets Criteria	NA	NA	NA	Meets Criteria
13 Balscadden Road Window 11	>27	28.74	Meets Criteria	NA	NA	NA	Meets Criteria

*Note - The analysis indicates that all of the windows assessed meet the relevant Vertical Sky Component (VSC) criteria. This means that the occupants of these buildings will not notice a reduction in the amount of skylight as stated in the BRE Guidance, *"If this VSC is greater than 27% then enough skylight should still be reaching the window of the existing building. Any reduction below this level should be kept to a minimum. If the VSC, with the new development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight".*

8 (B) Amenity Area Sunlight Analysis Results

The below testing criteria is contained within the BRE Guidance and is stated as follows, *"As a check, it is recommended that at least half of the amenity areas listed above should receive at least two hours of sunlight on 21 March"*. The amenity areas of Block B, Block C and the public realm have been tested and are illustrated below;

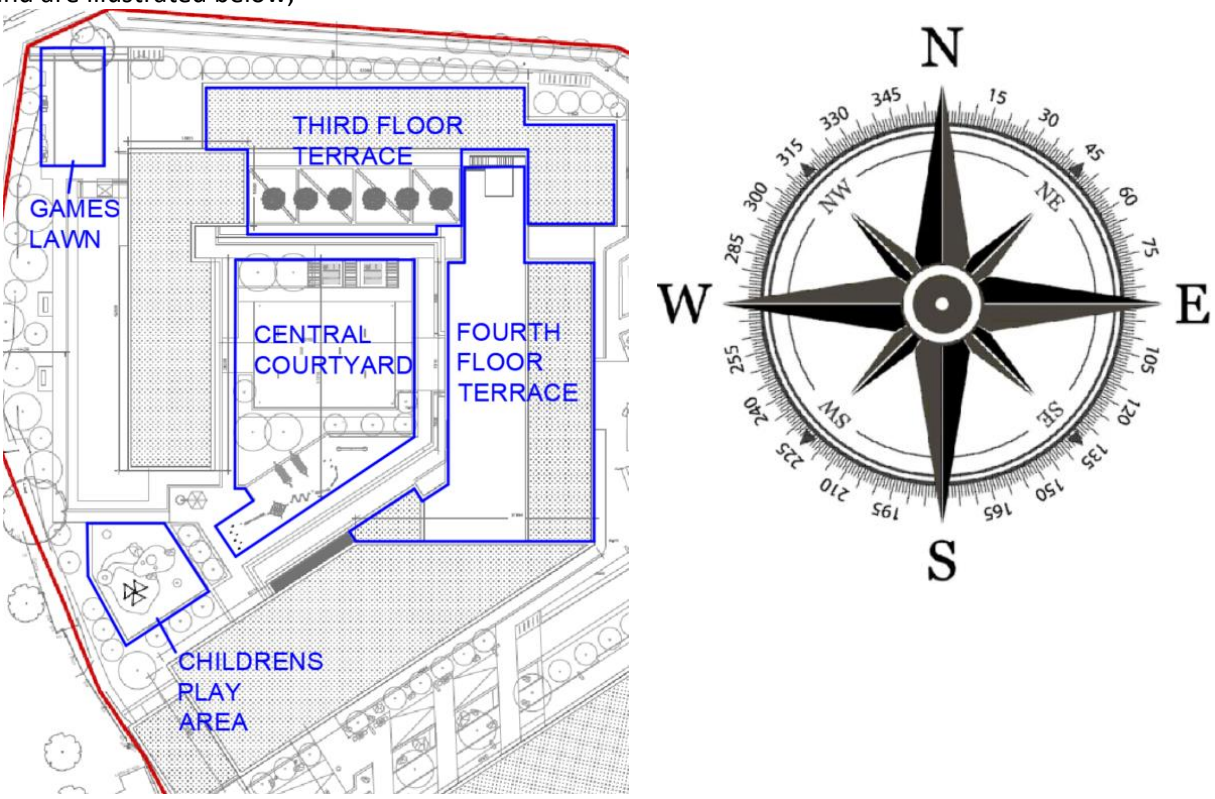

Figure 11 - Block B Amenity Area References

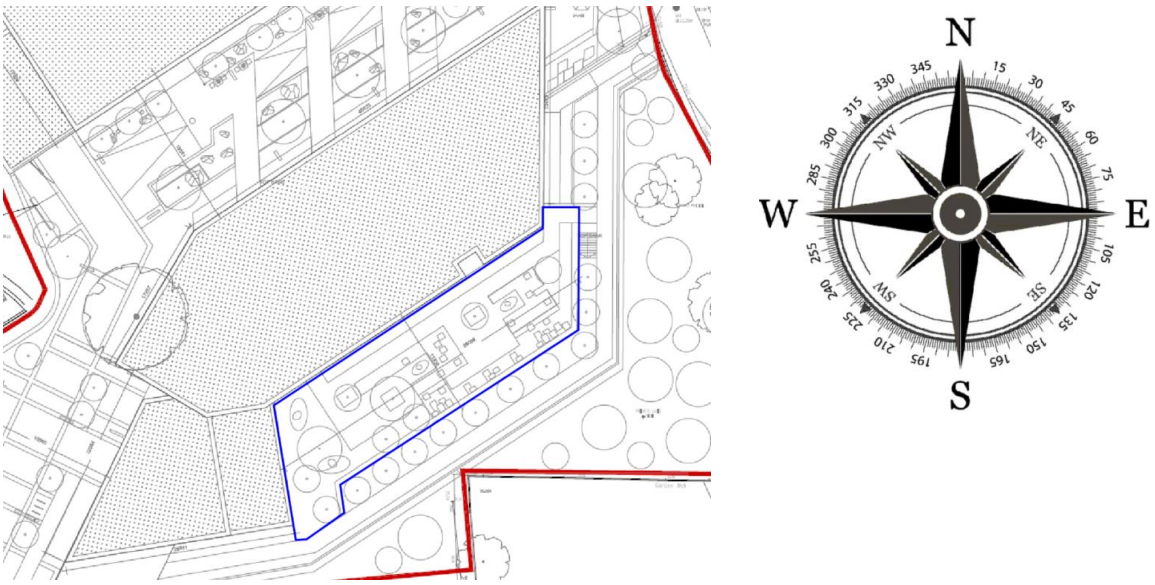

Figure 12 - Block C Amenity Area

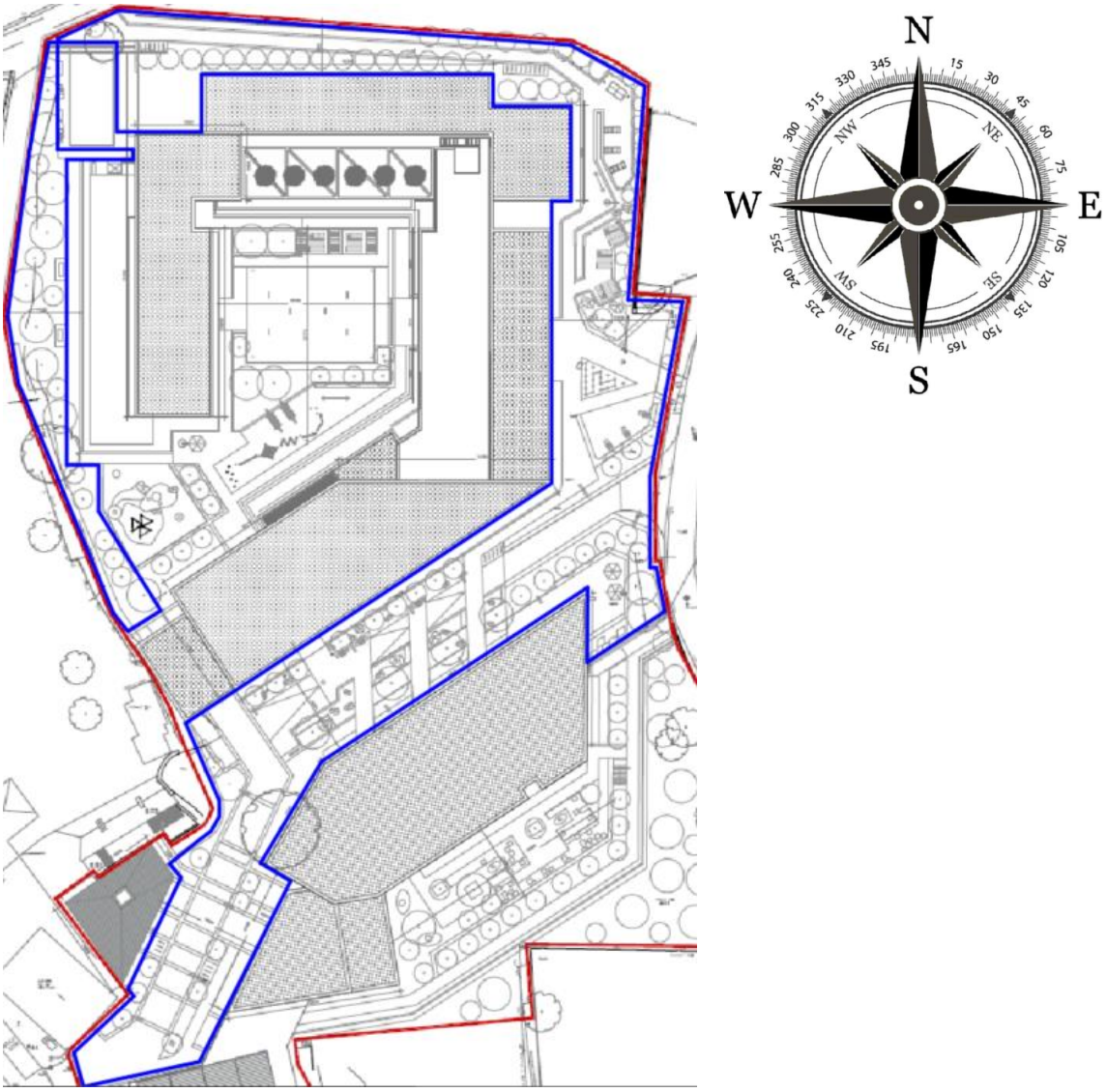

Figure 13 - Public Realm Area

Please see analysis below;

*Please note that every square highlighted below with a colour is receiving more than 2 hours worth of sunlight on the 21st of March. The brighter the colour the more sunlight hours it is receiving. The grey massings indicate local topography.

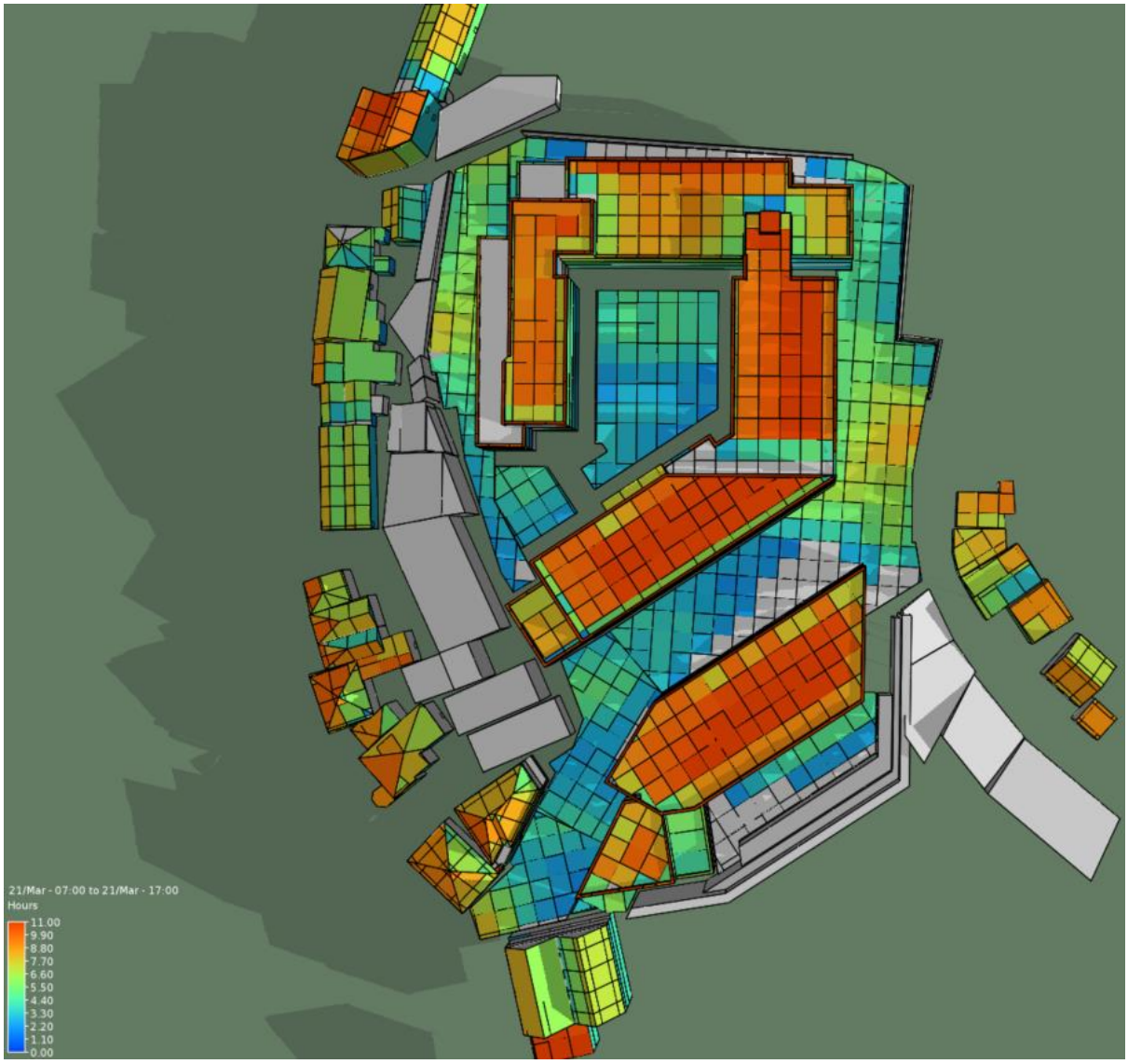

Figure 14 - March 21st, 08.00

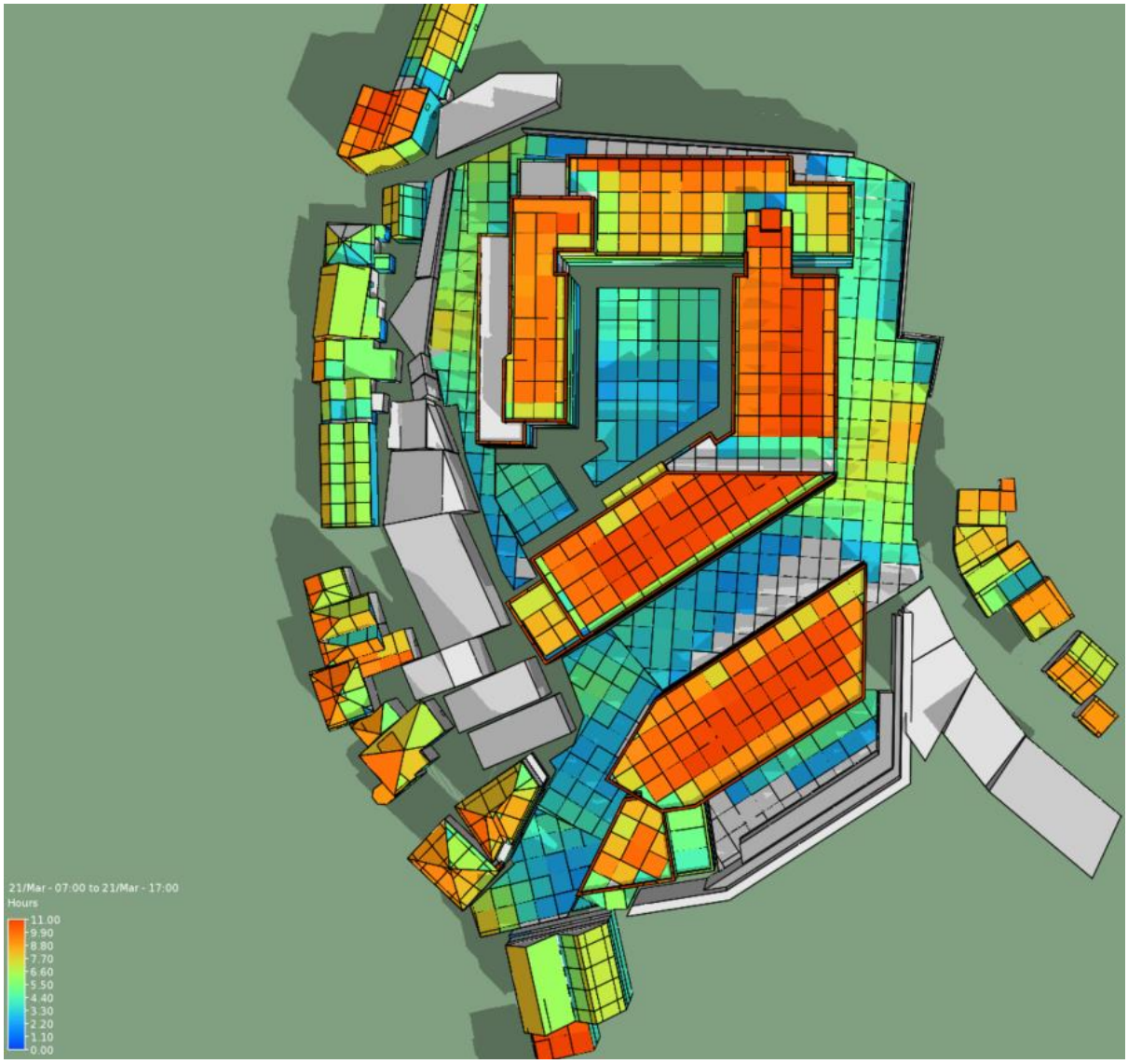

Figure 15 - March 21st, 10.00

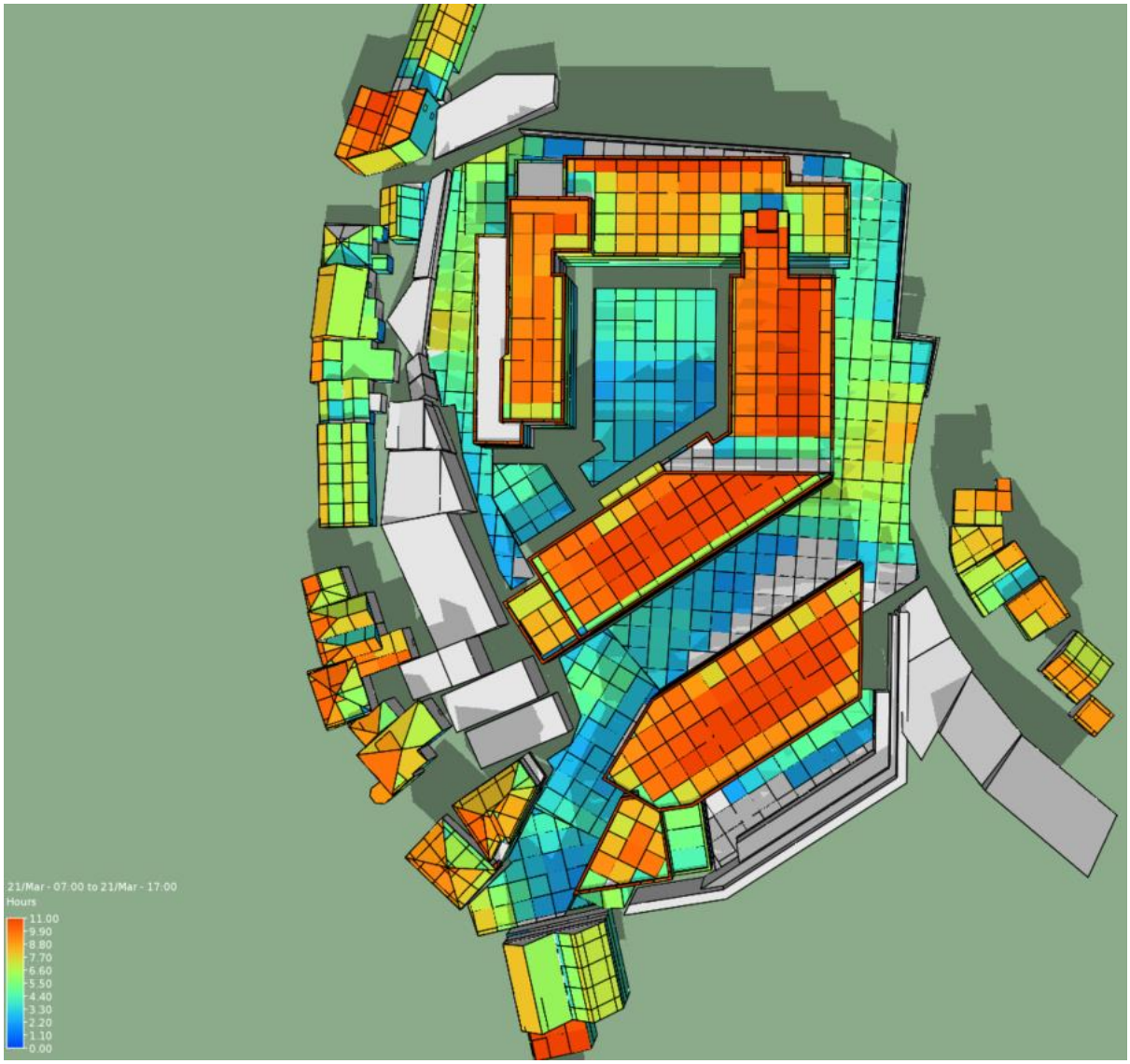

Figure 16 - March 21st, 12.00

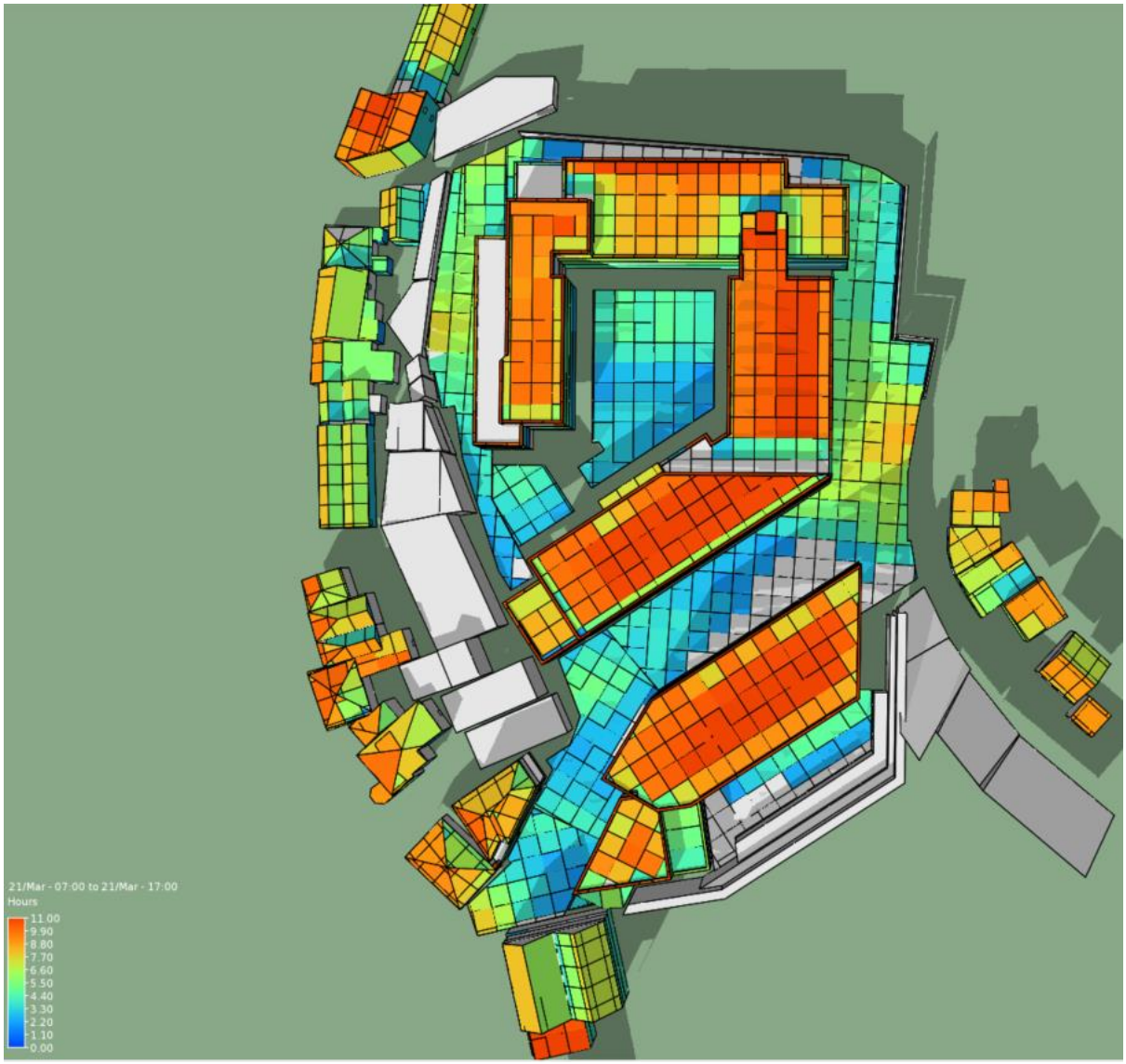

Figure 17 - March 21st, 14.00

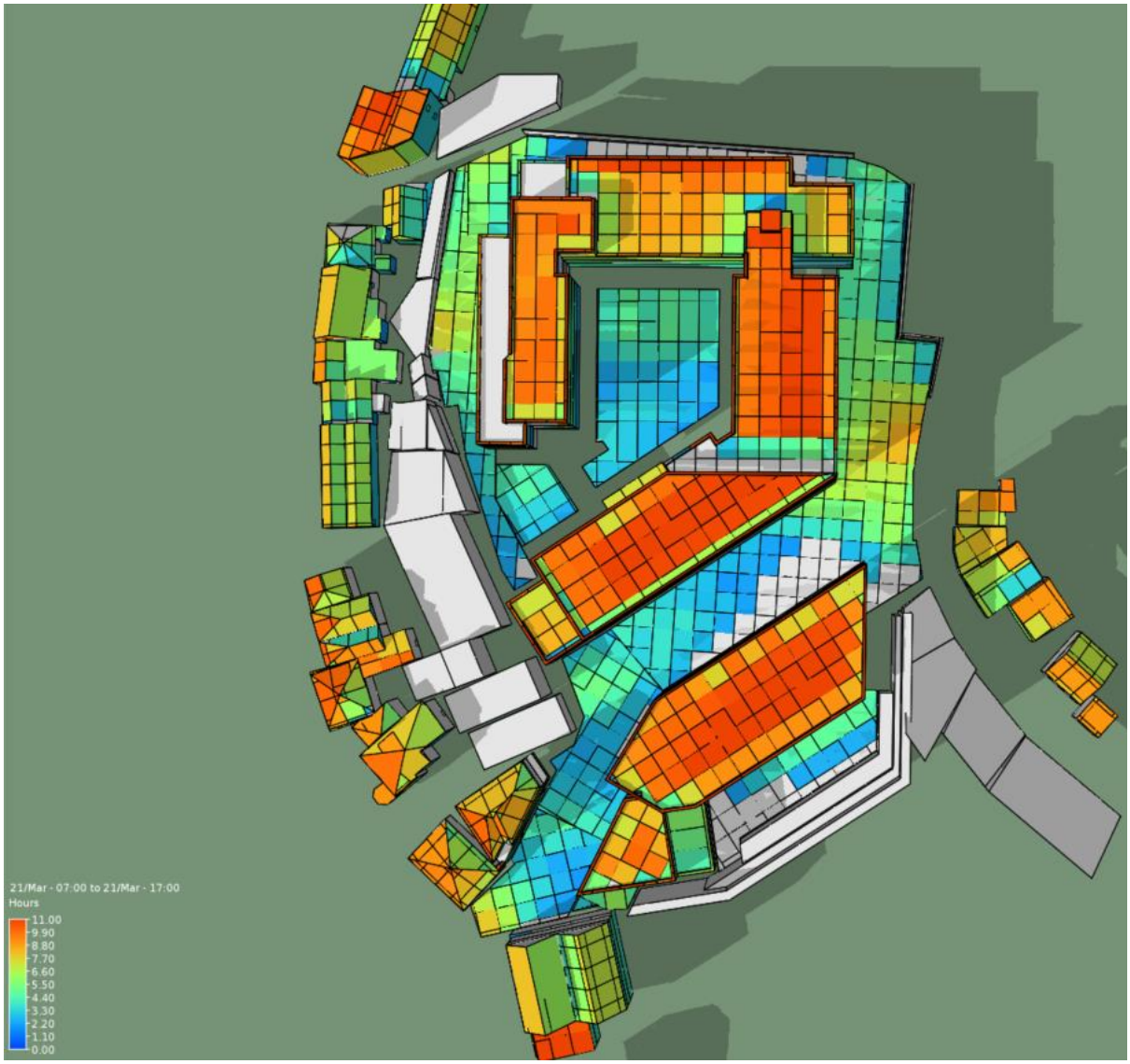

Figure 18 - March 21st, 16.00

Table 2 - Amenity Area Sunlight Results

Sunlight Analysis 21st of March					
Amenity Area Reference	Criteria				
	BRE Target [%]	Total Amenity Area [m2]	Total Amenity Area Receiving More Than 2 Hours [m2]	Percentage of Amenity Area Receiving 2 Hours [%]	Status
Games Lawn	50	123	123	100.00	Meets Criteria
Childrens Play Area	50	158	158	100.00	Meets Criteria
Block B - Central Courtyard	50	772	772	100.00	Meets Criteria
Block B - 3rd Floor Roof Terrace	50	783	767	97.96	Meets Criteria
Block B - 4th Floor Roof Terrace	50	839	721	85.94	Meets Criteria
Block C - Amenity Area	50	432	267	61.81	Meets Criteria
Public Realm	50	3873	3329	85.95	Meets Criteria
Total	50	6980	6137	87.92	Meets Criteria

*Note – All amenity areas and public realm are well in excess of the sunlight BRE Guidelines of achieving 2 Hours' worth of sunlight on the 21st of March (equinox), *"As a check, it is recommended that at least half of the amenity areas listed above should receive at least two hours of sunlight on 21 March".*

9 (C) Loss of Sunlight Results

The below testing criteria is contained within the BRE Guidance and is stated as follows, *"If this window point can receive more than one quarter of APSH, including at least 5% of APSH in the winter months between 21 September and 21 March, then the room should still receive enough sunlight", "Any reduction in sunlight access below this level should be kept to a minimum. If the available sunlight hours are both less than the amount above and less than 0.8 times their former value, either over the whole year or just in the winter months (21 September to 21 March), then the occupants of the existing building will notice the loss of sunlight; If the overall annual loss is greater than 4% of APSH, the room may appear colder and less cheerful and pleasant"* and *"To asses loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings, and conservatories, should be checked and if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun.".* Please read results in conjunction with Section *"5.3 (C) Loss of Sunlight".* This section explains the steps taken (A, B, C and D) as annotated in the results table below.

Table 3 - Loss of Sunlight Results

General Information	Proposed Development													
	(A)				(B)	(C)			D					
	If the centre of a window facing within 90° of due south can receive more than a quarter (25%) of APSH (Annual Probable Sunlight Hours), including at least 5% of APSH in the winter months between the 21st of September and the 21st of March, then the room should still receive enough sunlight. No further analysis needs to be carried out for these windows. If either the annual (APSH) or winter sunlight hours are below the criteria, then the analysis moves onto step B - D.				The existing values are then determined for any of the windows which do not meet the criteria in (A)	If the available sunlight hours are both less than the values in (A) less than 0.8 times their formal value (i.e. 20% reduction) either over the whole year (APSH) or just in the winter months (21st September to 21st March), then the occupants of the existing building will notice the loss of sunlight.			Additionally, if the overall annual loss is greater than 4% of APSH, the room may appear colder and less cheerful and pleasant. This is carried out for any window that does not achieve the thresholds as set out in (A).					
House Name	Period	Proposed [%]	BRE Target [%]	Status	Existing [%]	BRE Reduction Target [%]	Reduction [%]	Overal Status	Period	Proposed [%]	Existing [%]	BRE Overal Loss Target [%]	Overal Loss [%]	Status
1-6 Emo House Window 1	APSH	35	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	38	5	Meets Criteria	NA				NA	NA	NA	NA	NA	
1-6 Emo House Window 2	APSH	24	25	Below Criteria	26	20	8	Meets Criteria	APSH	24	26	4	2	Meets Criteria
	Winter	27	5	Meets Criteria	27		0		NA	NA	NA	NA	NA	
13 Abbey Street 49	APSH	36	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	19	5	Meets Criteria					NA	NA	NA	NA	NA	
13 Abbey Street 50	APSH	41	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	25	5	Meets Criteria					NA	NA	NA	NA	NA	
13 Abbey Street 51	APSH	44	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	29	5	Meets Criteria					NA	NA	NA	NA	NA	
13 Abbey Street 52	APSH	44	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	30	5	Meets Criteria					NA	NA	NA	NA	NA	
7 Balscadden Road Window 4	APSH	29	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	21	5	Meets Criteria					NA	NA	NA	NA	NA	
8 Balscadden Road Window 5	APSH	30	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	29	5	Meets Criteria					NA	NA	NA	NA	NA	
8 Balscadden Road Window 6	APSH	36	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	33	5	Meets Criteria					NA	NA	NA	NA	NA	
8 Balscadden Road Window 7	APSH	34	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	31	5	Meets Criteria					NA	NA	NA	NA	NA	
9 Balscadden Road Window 8	APSH	46	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	43	5	Meets Criteria					NA	NA	NA	NA	NA	
9 Balscadden Road Window 9	APSH	43	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	38	5	Meets Criteria					NA	NA	NA	NA	NA	
13 Balscadden Road Window 10	APSH	48	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	41	5	Meets Criteria					NA	NA	NA	NA	NA	
13 Balscadden Road Window 11	APSH	40	25	Meets Criteria	NA	NA	NA	Meets Criteria	APSH	NA	NA	NA	NA	Meets Criteria
	Winter	24	5	Meets Criteria					NA	NA	NA	NA	NA	

*Note – Only windows that face within 90° of due south are assessed. The analysis indicates that all of the windows assessed meet the relevant Loss of Sunlight criteria. This means that the occupants of these buildings will still receive adequate sunlight as stated in the BRE Guidelines. All window references except for *"1-6 Emo House Window 2"* have achieved an APSH >25% and a winter result of >5%. This means that these windows should still receive enough sunlight as stated in the BRE Guidance, *"If this window point can receive more than one quarter of APSH, including at least 5% of APSH in the winter months between 21 September and 21 March, then the room should still receive enough sunlight".*

"1-6 Emo House Window 2" achieved an APSH of 24% which means the testing criteria had to assess the existing values without the Proposed Development in place (See Section 5.3 (C) Loss of Sunlight, points, B, C and D). As the reduction in sunlight was not less than less than 0.8 times their formal value

(i.e. 20% reduction), the occupants of the building will not notice the loss of sunlight as stated in the BRE Guidance, *"Any reduction in sunlight access below this level should be kept to a minimum. If the available sunlight hours are both less than the amount above and less than 0.8 times their former value, either over the whole year or jut in the winter months (21 September to 21 March), then the occupants of the existing building will notice the loss of sunlight"*. Additionally, the overall loss was not greater than 4% so the room will not appear colder and less cheerful and pleasant as stated in the BRE Guidance, *"If the overall annual loss is greater than 4% of APSH, the room may appear colder and less cheerful and pleasant".*

10 (D) Average Daylight Factor (ADF) Results

The below testing criteria is contained within the BRE Guidance and is stated as follows, *"In housing BS 8206-2 also gives minimum values of ADF of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms".* Additionally, the testing criteria for combined kitchen/ living/ dining areas is contained within "*BS 8206-2 2008"* and is stated as follows, *"Where one room serves more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example, in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%."* Please see summary results below with the result for every room highlighted in Appendix A;

Table 4 - Average Daylight Factor Results

Criteria			
Block	Number of Rooms Assessed	Number of Rooms Passed	Pass Rate [%]
A	6	6	100.0
B	352	347	98.6
C	128	128	100.0
D	16	16	100.0
Total	502	497	99.0

As can be seen from the results in the table above, the vast majority of room's meet the criteria set out in the BRE Guidelines and "*BS-8206-2 2008"* and are also in line with the development standards for new apartments as set out by the Department of Housing. Every habitable room within the Proposed Development has been tested. In our professional opinion, this level of pass rate is extremely high. It should be noted that the criteria are not stringent standards that need to be met, they are good practice guidance only and must be considered as one of range of factors when designing a development.

Additionally, we have used Method 2 to complete this daylight analysis (refer to Section *"2 Relevant Guidelines"* for "*IS EN 17037:2018"* & "*BS EN 17037:2018"* criteria). Method 2 requires a space to meet a target illuminance of 300 Lux, across 50% of the reference plane for half of the daylight hours of the year (Criteria 1). The minimum target illuminance of 100 Lux is also required across 95% of the reference plane for half of the daylight hours (Criteria 2). Both criteria must be achieved for a space to meet *"IS EN 10737:2018"*.

Testing has also been carried out in line with the British adoption of the European standard, *"BS EN 17037:2018"*. This standard has produced a national annex which gives more appropriate daylight targets for applicability within residential schemes. Utilising the same calculation method (method 2), the below daylight levels are considered to be more in line with the BRE Guidance and *"BS 8206 – 2:2008".*

- Bedrooms = 100 Lux across 50% of the area of the room
- Living Space = 150 Lux across 50% of the area of the room
- Kitchens = 200 Lux across 50% of the area of the room

A representative sample of units was taken to assess "*IS EN 17037:2018"* and "*BS EN 17037:2018"*. Figure 19 below highlights the representative sample taken for Block B which comprises of a strip of apartments (L00 – L04) facing a range of different orientations.

Figure 20 -24 below highlights the representative sample taken for Block C which comprises of a strip of apartments (L00 – L04) facing towards Block B.

Figure 19 - Block B (L00 – L04) Sample Testing Highlighted in Green

Figure 20 - Block C Ground Floor Sample Testing Highlighted in Green

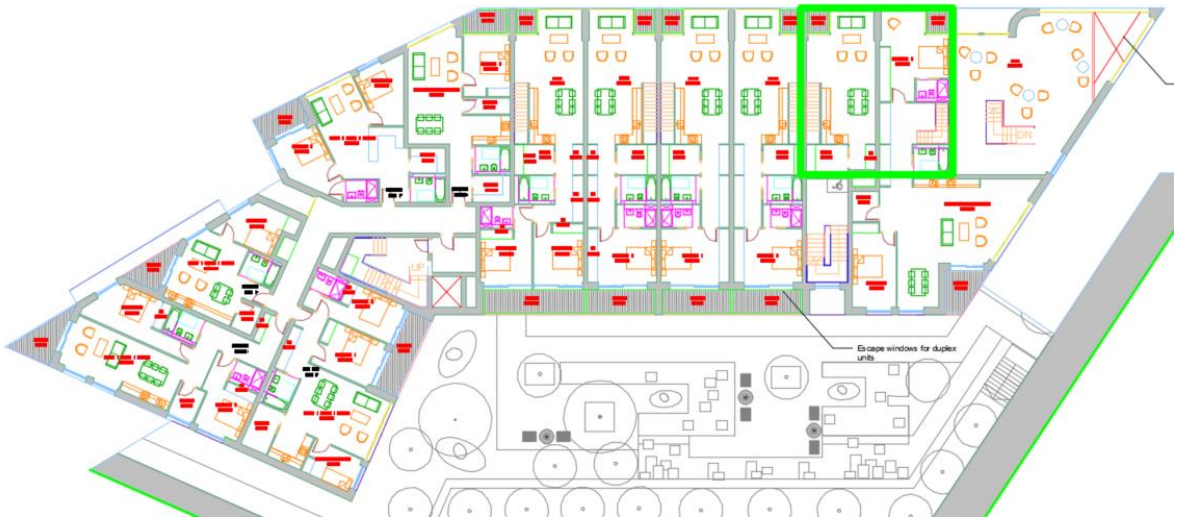

Figure 21 - Block C First Floor Sample Testing Highlighted in Green

Figure 22 - Block C Second Floor Sample Testing Highlighted in Green

Figure 23 - Block C Third Floor Sample Testing Highlighted in Green

Figure 24 - Block C Fourth Floor Sample Testing Highlighted in Green

These units were considered as the representative sample as they account for the majority of orientations as seen by each apartment type, thus providing an indication of how the overall development will perform when assessing the criteria of "*IS EN 10737:2018"* and "*BS EN 17037:2018."*

Please see results below for both Blocks carried out in line with both "*IS EN 10737:2018"* and "*BS EN 17037:2018."* Please note for the "*BS EN 17037:2018"* results (Table 7 and 8) that bedrooms and combined kitchen/ living spaces have two separate testing criteria, i.e. 100 lux for bedrooms and 200 lux for combined kitchen/ living spaces. This results in some cells contained within the tables being left blank depending on what room type (Bedroom or combined kitchen/ living) is being assessed and is based upon their associated testing criteria.

Table 5 - Block B IS EN 17037 Results

Criteria	Block B - Method 2		Status
	>300 Lux >50% Hours >50% Area	>100 Lux >50% Hours >95% Area	
Room name	*% Area Meeting Target*	*% Area Meeting Target*	
L00 - Unit G12 - Living/ Dining/ Kitchen	67.9	100.0	Meets Criteria
L00 - Unit G13 - Bedroom 1	100.0	100.0	Meets Criteria
L00 - Unit G13 - Living/ Dining/ Kitchen	100.0	100.0	Meets Criteria
L00 - Unit G14 - Bedroom 1	87.5	100.0	Meets Criteria
L00 - Unit G14 - Bedroom 2	100.0	100.0	Meets Criteria
L00 - Unit G14 - Living/ Dining/ Kitchen	91.4	100.0	Meets Criteria
L00 - Unit G29 - Bedroom 1	15.8	76.3	Below Criteria
L00 - Unit G29 - Bedroom 2	30.8	92.3	Below Criteria
L00 - Unit G29 - Living/ Dining/ Kitchen	38.2	74.5	Below Criteria
L01 - Unit 112 - Living/ Dining/ Kitchen	66.7	100.0	Meets Criteria
L01 - Unit 113 - Bedroom 1	100.0	100.0	Meets Criteria
L01 - Unit 113 - Living/ Dining/ Kitchen	96.4	100.0	Meets Criteria
L01 - Unit 114 - Bedroom 1	100.0	100.0	Meets Criteria
L01 - Unit 114 - Bedroom 2	100.0	100.0	Meets Criteria
L01 - Unit 114 - Living/ Dining/ Kitchen	100.0	100.0	Meets Criteria
L01 - Unit 129 - Bedroom 1	23.7	84.2	Below Criteria
L01 - Unit 129 - Bedroom 2	35.9	89.7	Below Criteria
L01 - Unit 129 - Living/ Dining/ Kitchen	41.2	75.5	Below Criteria
L02 - Unit 212 - Living/ Dining/ Kitchen	78.6	100.0	Meets Criteria
L02 - Unit 213 - Bedroom 1	100.0	100.0	Meets Criteria
L02 - Unit 213 - Living/ Dining/ Kitchen	100.0	100.0	Meets Criteria
L02 - Unit 214 - Bedroom 1	100.0	100.0	Meets Criteria
L02 - Unit 214 - Bedroom 2	100.0	100.0	Meets Criteria
L02 - Unit 214 - Living/ Dining/ Kitchen	100.0	100.0	Meets Criteria
L02 - Unit 229 - Bedroom 1	44.7	100.0	Below Criteria
L02 - Unit 229 - Bedroom 2	76.9	97.4	Meets Criteria
L02 - Unit 229 - Living/ Dining/ Kitchen	59.8	91.2	Below Criteria
L03 - Unit 329 - Bedroom 1	68.4	100.0	Meets Criteria
L03 - Unit 329 - Bedroom 2	92.3	97.4	Meets Criteria
L03 - Unit 329 - Living/ Dining/ Kitchen	71.6	100.0	Meets Criteria
L04 - Unit 429 - Bedroom 1	100.0	100.0	Meets Criteria
L04 - Unit 429 - Bedroom 2	100.0	100.0	Meets Criteria
L04 - Unit 429 - Living/ Dining/ Kitchen	91.4	100.0	Meets Criteria

Table 6 - Block C IS EN 17037 Results

Criteria	Block C - Method 2		Status
	>300 Lux >50% Hours >50% Area	>100 Lux >50% Hours >95% Area	
Room name	*% Area Meeting Target*	*% Area Meeting Target*	
L00 - Unit G5 - Bedroom 1	100.0	100.0	Meet Criteria
L00 - Unit G6 - Bedroom 1	98.0	100.0	Meet Criteria
L01 - Unit G5 - Living/ Dining/ Kitchen	54.3	100.0	Meet Criteria
L01 - Unit G6 - Bedroom 2	87.2	100.0	Meet Criteria
L02 - Unit 211 - Bedroom 1	100.0	100.0	Meet Criteria
L02 - Unit 211 - Bedroom 2	89.0	100.0	Meet Criteria
L02 - Unit 211 - Living/ Dining/ Kitchen	56.9	100.0	Meet Criteria
L02 - Unit 212 - Bedroom 1	100.0	100.0	Meet Criteria
L02 - Unit 212 - Bedroom 2	100.0	100.0	Meet Criteria
L02 - Unit 212 - Living/ Dining/ Kitchen	100.0	100.0	Meet Criteria
L03 - Unit 310 - Bedroom 1	100.0	100.0	Meet Criteria
L03 - Unit 310 - Bedroom 2	100.0	100.0	Meet Criteria
L03 - Unit 310 - Living/ Dining/ Kitchen	72.6	100.0	Meet Criteria
L03 - Unit 311 - Bedroom 1	100.0	100.0	Meet Criteria
L03 - Unit 311 - Bedroom 2	100.0	100.0	Meet Criteria
L03 - Unit 311 - Living/ Dining/ Kitchen	100.0	100.0	Meet Criteria
L04 - Unit 411 - Bedroom 1	100.0	100.0	Meet Criteria
L04 - Unit 411 - Bedroom 2	100.0	100.0	Meet Criteria
L04 - Unit 411 - Living/ Dining/ Kitchen	93.1	100.0	Meet Criteria
L04 - Unit 412 - Bedroom 1	100.0	100.0	Meet Criteria
L04 - Unit 412 - Bedroom 2	100.0	100.0	Meet Criteria
L04 - Unit 412 - Living/ Dining/ Kitchen	100.0	100.0	Meet Criteria

Table 7 - Block B BS EN 17037 Results

Criteria	Block B - Method 2		Status
	Bedroom >100 Lux >50% Hours >50% Area	Kitchen/Living Space >200 Lux >50% Hours >50% Area	
Room name	*% Area Meeting Target*	*% Area Meeting Target*	
L00 - Unit G12 - Living/ Dining/ Kitchen	-	85.7	Meets Criteria
L00 - Unit G13 - Bedroom 1	100.0	-	Meets Criteria
L00 - Unit G13 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria
L00 - Unit G14 - Bedroom 1	100.0	-	Meets Criteria
L00 - Unit G14 - Bedroom 2	100.0	-	Meets Criteria
L00 - Unit G14 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria
L00 - Unit G29 - Bedroom 1	76.3	-	Meets Criteria
L00 - Unit G29 - Bedroom 2	92.3	-	Meets Criteria
L00 - Unit G29 - Living/ Dining/ Kitchen	-	52.9	Meets Criteria
L01 - Unit 112 - Living/ Dining/ Kitchen	-	84.5	Meets Criteria
L01 - Unit 113 - Bedroom 1	100.0	-	Meets Criteria
L01 - Unit 113 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria
L01 - Unit 114 - Bedroom 1	100.0	-	Meets Criteria
L01 - Unit 114 - Bedroom 2	-	-	Meets Criteria
L01 - Unit 114 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria
L01 - Unit 129 - Bedroom 1	84.2	-	Meets Criteria
L01 - Unit 129 - Bedroom 2	89.7	-	Meets Criteria
L01 - Unit 129 - Living/ Dining/ Kitchen	-	57.8	Meets Criteria
L02 - Unit 212 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria
L02 - Unit 213 - Bedroom 1	100.0	-	Meets Criteria
L02 - Unit 213 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria
L02 - Unit 214 - Bedroom 1	100.0	-	Meets Criteria
L02 - Unit 214 - Bedroom 2	100.0	-	Meets Criteria
L02 - Unit 214 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria
L02 - Unit 229 - Bedroom 1	100.0	-	Meets Criteria
L02 - Unit 229 - Bedroom 2	97.4	-	Meets Criteria
L02 - Unit 229 - Living/ Dining/ Kitchen	-	69.6	Meets Criteria
L03 - Unit 329 - Bedroom 1	100.0	-	Meets Criteria
L03 - Unit 329 - Bedroom 2	97.4	-	Meets Criteria
L03 - Unit 329 - Living/ Dining/ Kitchen	-	80.4	Meets Criteria
L04 - Unit 429 - Bedroom 1	100.0	-	Meets Criteria
L04 - Unit 429 - Bedroom 2	100.0	-	Meets Criteria
L04 - Unit 429 - Living/ Dining/ Kitchen	-	99.0	Meets Criteria

Table 8 - Block C BS EN 17037 Results

Criteria	Block C - Method 2		Status
	Bedroom >100 Lux >50% Hours >50% Area	Kitchen/Living Space >200 Lux >50% Hours >50% Area	
Room name	*% Area Meeting Target*	*% Area Meeting Target*	
L00 - Unit G5 - Bedroom 1	100.0	-	Meets Criteria
L00 - Unit G6 - Bedroom 1	100.0	-	Meets Criteria
L01 - Unit G5 - Living/ Dining/ Kitchen	-	69.3	Meets Criteria
L01 - Unit G6 - Bedroom 2	100.0	-	Meets Criteria
L02 - Unit 211 - Bedroom 1	100.0	-	Meets Criteria
L02 - Unit 211 - Bedroom 2	100.0	-	Meets Criteria
L02 - Unit 211 - Living/ Dining/ Kitchen	-	89.2	Meets Criteria
L02 - Unit 212 - Bedroom 1	100.0	-	Meets Criteria
L02 - Unit 212 - Bedroom 2	100.0	-	Meets Criteria
L02 - Unit 212 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria
L03 - Unit 310 - Bedroom 1	100.0	-	Meets Criteria
L03 - Unit 310 - Bedroom 2	100.0	-	Meets Criteria
L03 - Unit 310 - Living/ Dining/ Kitchen	-	99.0	Meets Criteria
L03 - Unit 311 - Bedroom 1	100.0	-	Meets Criteria
L03 - Unit 311 - Bedroom 2	100.0	-	Meets Criteria
L03 - Unit 311 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria
L04 - Unit 411 - Bedroom 1	100.0	-	Meets Criteria
L04 - Unit 411 - Bedroom 2	100.0	-	Meets Criteria
L04 - Unit 411 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria
L04 - Unit 412 - Bedroom 1	100.0	-	Meets Criteria
L04 - Unit 412 - Bedroom 2	100.0	-	Meets Criteria
L04 - Unit 412 - Living/ Dining/ Kitchen	-	100.0	Meets Criteria

*Note – Block B, as tested under the "*IS EN 17037"* standard has 8 rooms out of 33 which are below the criteria. However, when tested under the "*BS EN 17037"* there are no failures. These failures are around the fact that the "*IS EN 17037"* standard does not have a national annex as the "*BS EN 17037"* standard does. The "*BS EN 17037"* national annex accounts for the fact that room activities have different requirements for lighting levels. The "*IS EN 17037"* standard tests every room against the same lighting requirement regardless of the activity taking place inside the room. This leads to far more stringent testing circumstances which do not currently reflect best practice design. Block C has no failures when tested under both standards.

10.1 Average Daylight Factor Developed Design

To achieve the above targets, the design process considered a number of different iterations in relation to daylight/ sunlight (please see some examples highlighted below) within the Proposed Development scheme. This was carried out in line with items 6.5 – 6.7 of the *"Sustainable Urban Housing: Design Standards for New Apartments Guidelines 2020"* which specifically states the following;

- *"The provision of acceptable levels of natural light in new apartment developments is an important planning consideration as it contributes to the liveability and amenity enjoyed by apartment residents. In assessing development proposals, planning authorities must however weigh up the overall quality of the design and layout of the scheme and the measures proposed to maximise daylight provision with the location of the site and the need to ensure an appropriate scale of urban residential development."*
- *"Planning authorities should have regard to quantitative performance approaches to daylight provision outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision."*
- *"Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific. This may arise due to a design constraint associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution."*

In line with the above extracts, we have carried out a preliminary analysis in line with the BRE Guidance and "*BS 8206-2:2008"* which informed the design team of a baseline performance in relation to the daylight received within the apartments comprising the scheme. Early discussions with the design team concluded that with some alternative design solutions, the amount of natural light penetration into the scheme could be maximized. These alternative design solutions consisted of the following;

- Site Layout – 'maximise access to natural daylight, ventilation and views and to minimise overshadowing and loss of light'
- Building form and heights – 'coordinated building design to reduce the impact to daylight and sunlight from the building itself and on surrounding areas'
- Larger windows – 'maximise penetration of natural light into a space'
- Apartment Layout – 'strategic layout of apartments to promote access to daylight and sunlight to priority spaces i.e., living rooms'
- Balcony positions – 'strategic balcony positions maximise access to daylight and optimise residential amenity'

Please see examples below of the design process involved in achieving the Average Daylight Factors.

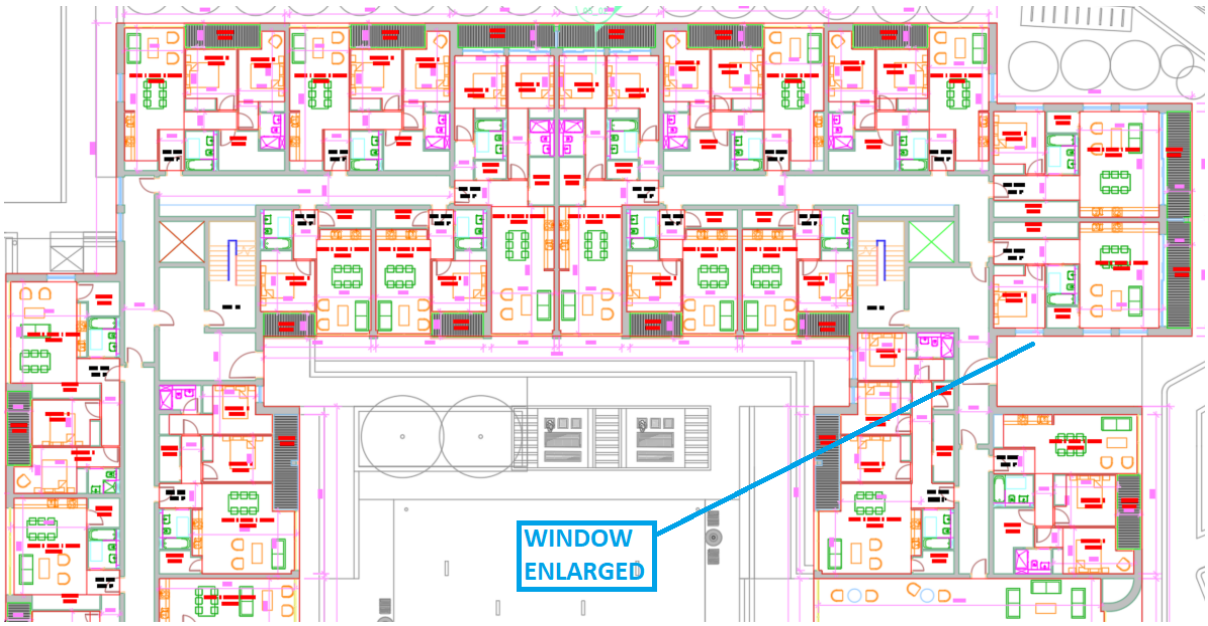

Figure 25 - Block B Ground Floor

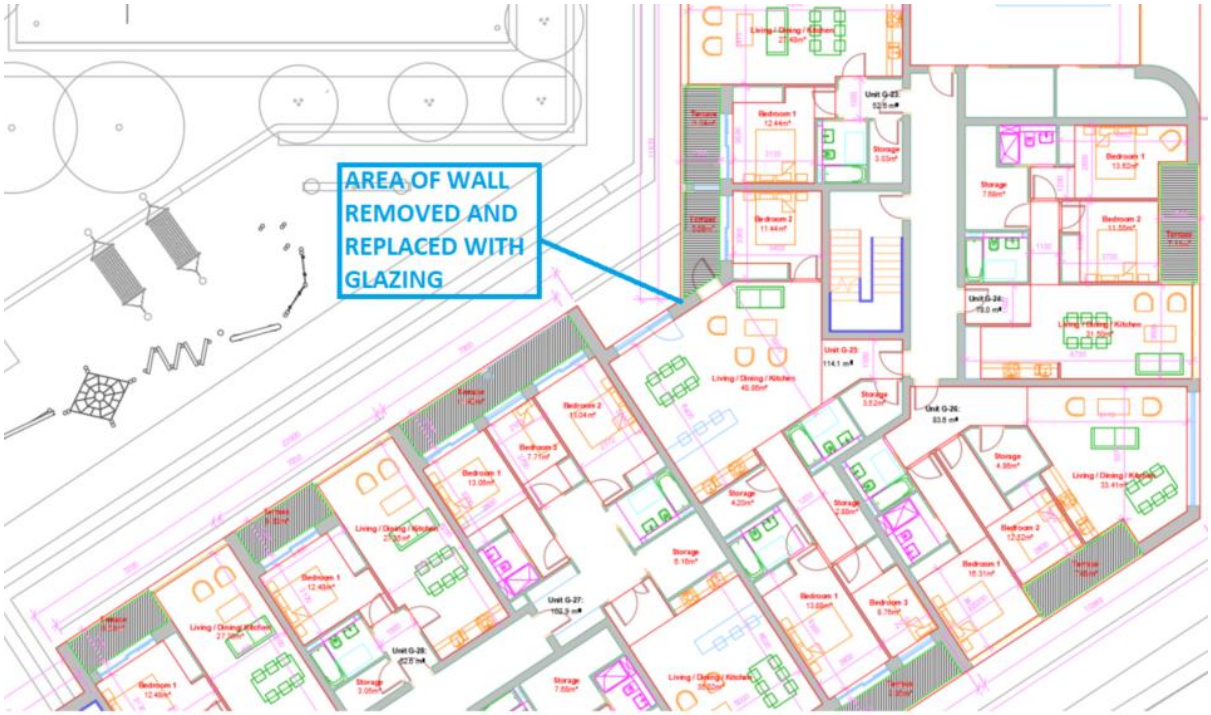

Figure 26 - Block B Ground Floor

Figure 27 - Block B First Floor

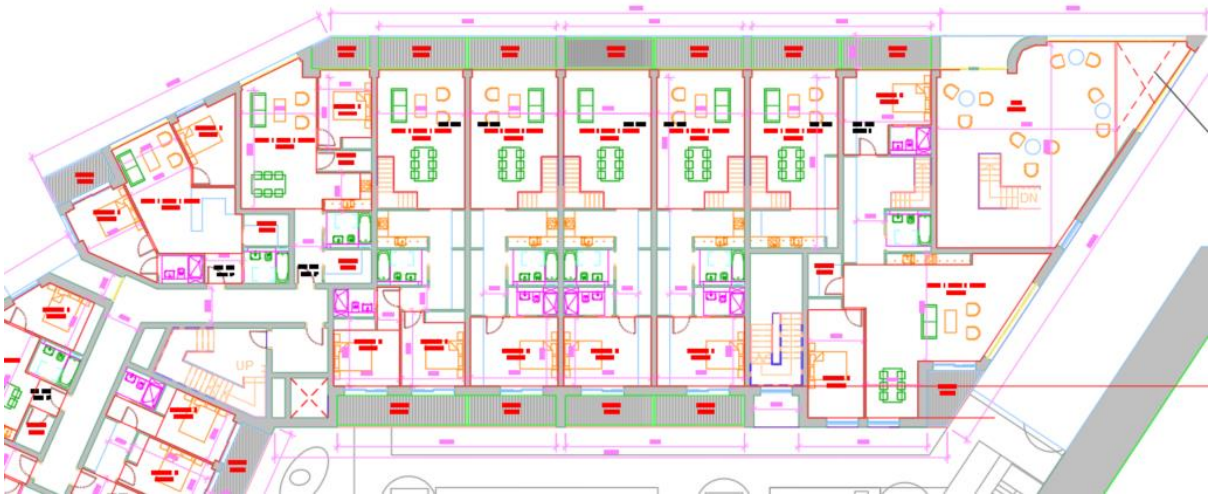

Figure 28 - Block C First Floor Original Design

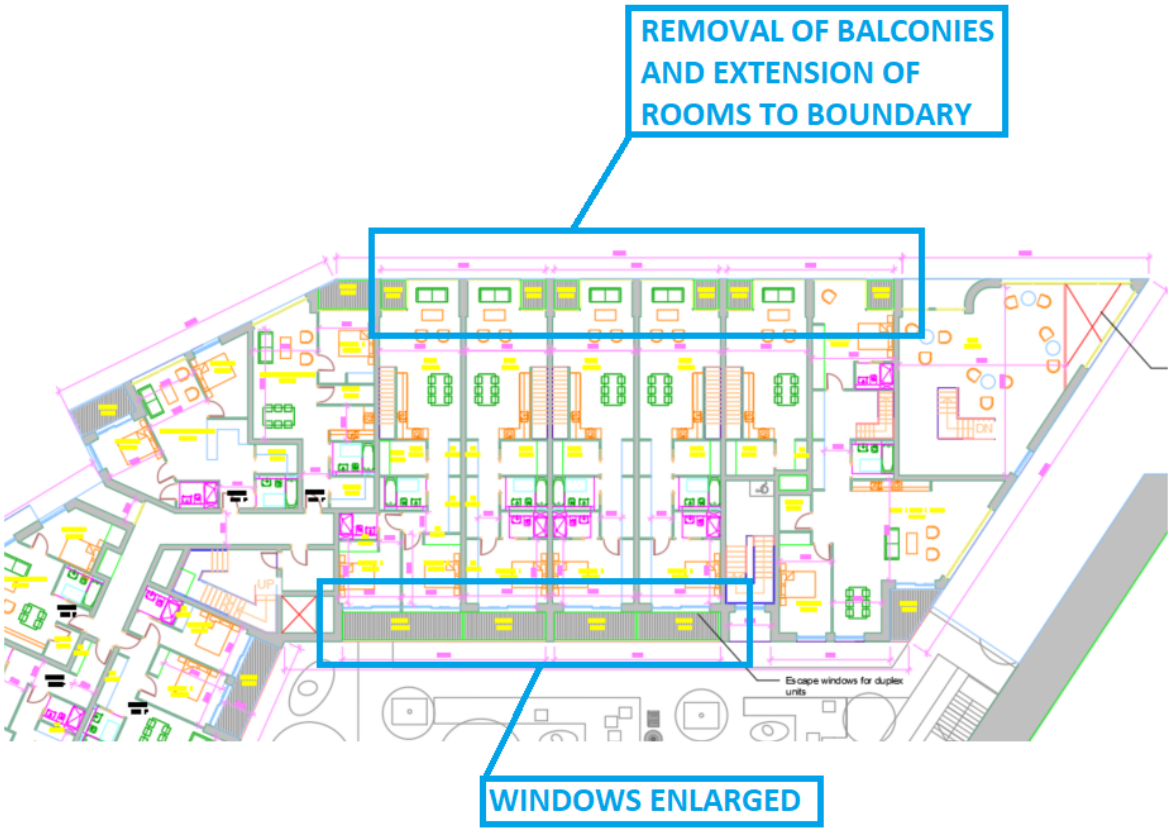

Figure 29 - Block C First Floor Improved Design

Figure 30 - Block D First Floor

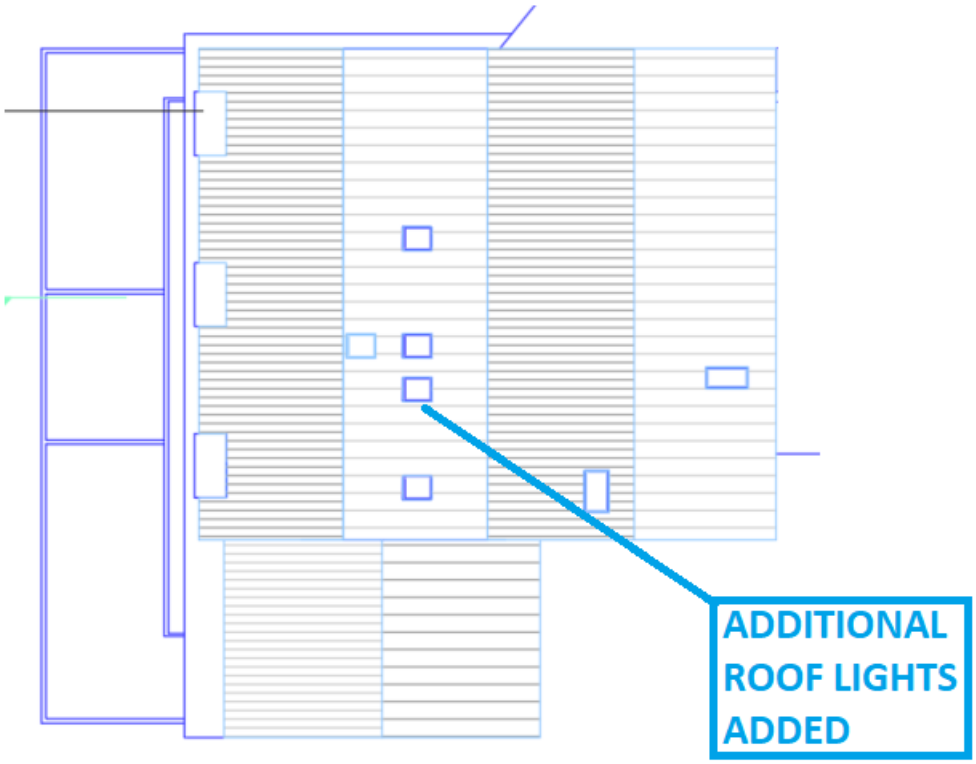

Figure 31 - Block D Roof

11 (E) Garden Analysis Results

The below testing criteria is contained within the BRE Guidance and is stated as follows, *"As a check, it is recommended that at least half of the amenity areas listed above should receive two hours of sunlight on 21 March"* and *"If an existing garden or open space is already heavily obstructed then any further loss of sunlight should be kept to a minimum. In this poorly sunlit case, if as a result of new development, the area which can receive two hours of direct sunlight on 21 March is reduced to less than 0.8 times its former size, this further loss of sunlight is significant. The garden or amenity area will tend to look more heavily overshadowed".* This has been carried out to satisfy the requirements contained with the FCC written opinion (Refer to SHD Pre-Application Consultation Request ABP-311179-21). Please see results below.

Table 9 - Garden Analysis Results

Sunlight Analysis 21st of March									
Garden Area Reference	Criteria								Overal Status
	A					B	C		
	If the garden areas with the new development in place receives two worth of sunlight on 50% of the garden during the equinox (21st of March), then the gardens meet the criteria contained within the BRE Guidance.					If the garden areas do not meet the criteria in (A), then the analysis determines the area of garden that does receives two worth of sunlight on the equinox (21st of March) without the Proposed Development in place.	If the garden areas, with the new development in place, are both less than criteria (A) and less than 0.8 times their former value, (i.e. 20% reduction) the loss of sunlight will be significant.		
	BRE Target [%]	Total Garden Area [m2]	Total Garden Area Receiving More Than 2 Hours [m2]	Percentage of Garden Area Receiving 2 Hours [%]	Status	Existing Total Garden Area Receiving More Than 2 Hours [m2]	BRE Reduction Target [%]	Reduction [%]	
A	50	36	21.83	60.64	Meets Criteria	NA	NA	NA	Meets Criteria
B	50	104	16.2	15.58	Below Criteria	19.58	<20	17.26	Meets Criteria
C	50	34	0	0.00	Below Criteria	0	<20	0.00	Meets Criteria
D	50	83	32.63	39.31	Below Criteria	32.63	<20	0.00	Meets Criteria
E	50	190	67.5	35.53	Below Criteria	76.5	<20	11.76	Meets Criteria
F	50	45	0	0.00	Below Criteria	0	<20	0.00	Meets Criteria

*Please note that all assessed gardens meet the relevant BRE criteria. The majority of the overshadowing is caused by the existing topography.

Please also note that every square highlighted below with a colour is receiving more than 2 hours worth of sunlight on the 21st of March. The brighter the colour the more sunlight hours it is receiving. The grey massings indicate local topography. Please note that all other buildings have coloured squares on them, however the below is to be read in conjunction with Figure 5 whcih highlights the garden areas used for assessment.

Figure 32 – Proposed Garden Analysis

Figure 33 - Existing Garden Analysis

12 (F) Overshadowing Assessment Results

*Please note that the green massing highlights topography and the blue massings highlight the Proposed Development & the surrounding houses. Please read both shadow plots with and without the Proposed Development in place in conjunction with each other. The function of the images is to highlight the shadow cast on the surrounding houses along Abbey Street and Main Street to satisfy the requirements contained with the FCC written opinion (Refer to SHD Pre-Application Consultation Request ABP-311179-21). The Proposed Development will have little to no impact on these houses in terms of overshadowing as the majority of the overshadowing is caused by the existing topography. This has been carried out to further supplement the testing as seen above in section *"11(E) Garden Analysis."*

Figure 34 - March 21st 08.00 Existing

Figure 35 - March 21st 08.00 Proposed

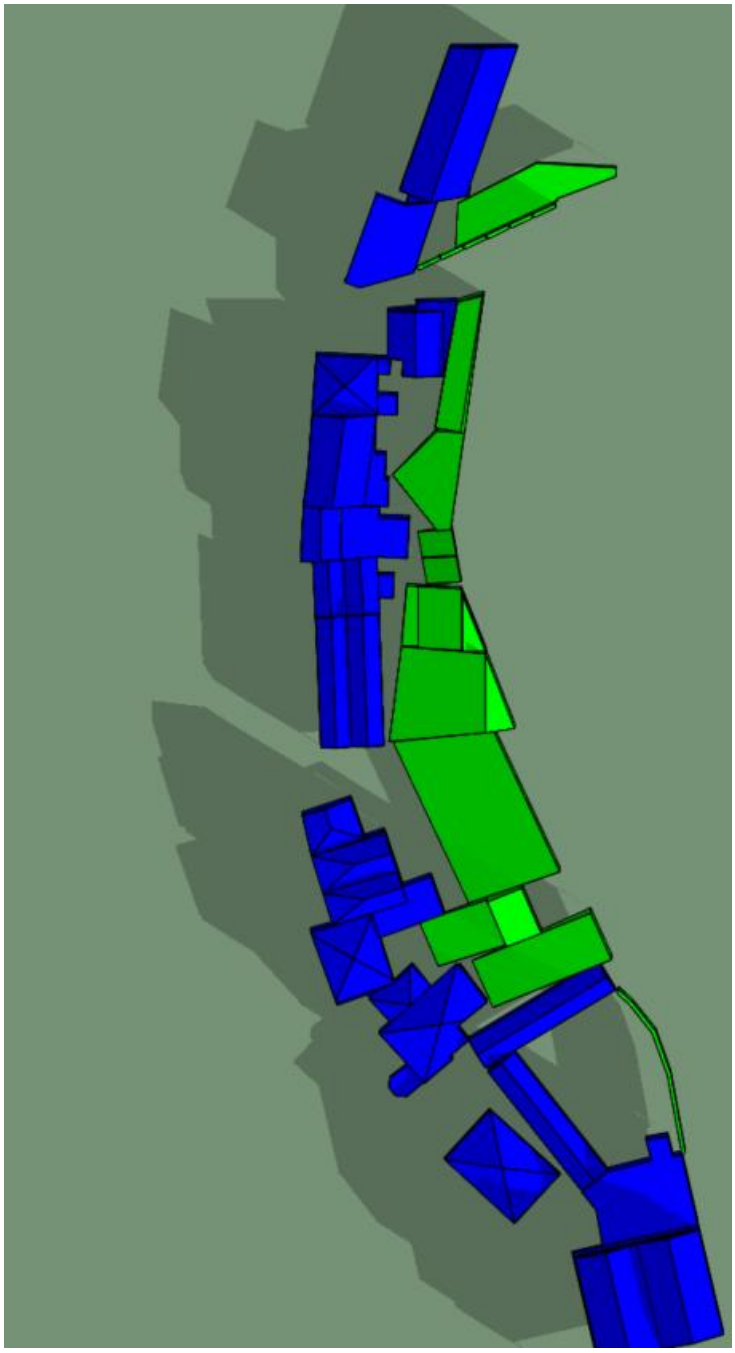

Figure 36 - March 21st 09.00 Existing

Figure 37 - March 21st 09.00 Proposed

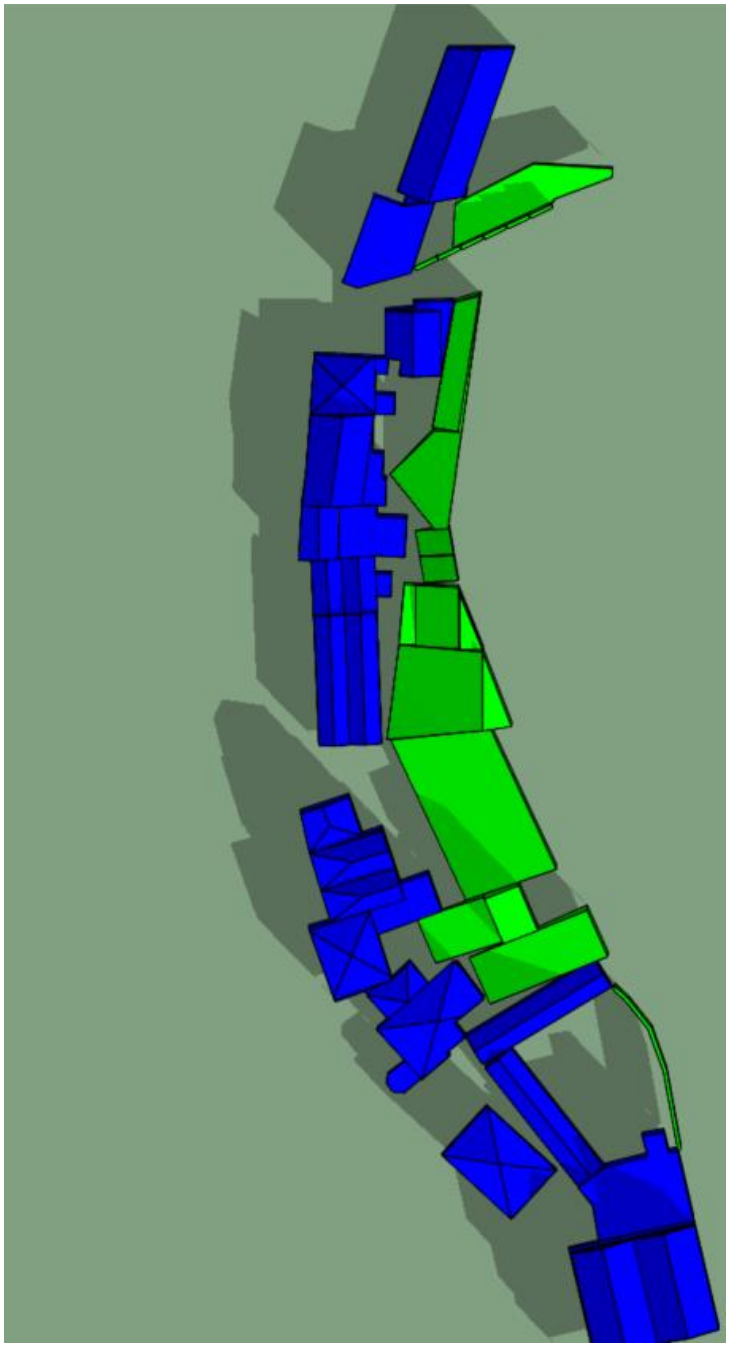

Figure 38 - March 21st 10.00 Existing

Figure 39 - March 21st 10.00 Proposed

Figure 40 - March 21st 11.00 Existing

Figure 41 - March 21st 11.00 Proposed

Figure 42 - March 21st 12.00 Existing

Figure 43 - March 21st 12.00 Proposed

Figure 44 - March 21st 13.00 Existing

Figure 45 - March 21st 13.00 Proposed

Figure 46 - March 21st 14.00 Existing

Figure 47 - March 21st 14.00 Proposed

Figure 48 - March 21st 15.00 Existing

Figure 49 - March 21st 15.00 Proposed

Figure 50 - March 21st 16.00 Existing

Figure 51 - March 21st 16.00 Proposed

*Please note that the Proposed Development will have little to no impact on these houses in terms of overshadowing as the majority of the overshadowing is caused by the existing topography.

13 Summary of Results

Library

(A) Light from the Sky – Property meets the criteria.

(B) Amenity Area Sunlight Analysis – Not assessed as this methodology is used for testing the Proposed Development only.

(C) Loss of Sunlight – Not applicable as assessed windows were not within 90° of due south.

(D) Average Daylight Factor - Not assessed as this methodology is used for testing the Proposed Development only.

(E) Garden Analysis – Not carried out as Proposed Development is orientated north of this property. The Proposed Development will have no impact on it.

(F) Overshadowing Assessment – Not carried out as Proposed Development is orientated north of this property. The Proposed Development will have no impact on it.

1-6 Emo House to 13 Abbey Street

(A) Light from the Sky – Properties meet the criteria.

(B) Amenity Area Sunlight Analysis – Not assessed as this methodology is used for testing the Proposed Development only.

(C) Loss of Sunlight – All assessed properties meet the criteria.

(D) Average Daylight Factor - Not assessed as this methodology is used for testing the Proposed Development only.

(E) Garden Analysis – All assessed gardens meet the relevant BRE criteria. The majority of the overshadowing is caused by the existing topography.

(F) Overshadowing Assessment - The Proposed Development will have little to no impact on these houses in terms of overshadowing as the majority of the overshadowing is caused by the existing topography. Shadow cast plots with and without the Proposed Development in place are presented which indicate that all overshadowing is caused by the existing topography. Shadow cast plots have been carried out from 08.00 – 16.00 on the 21st of March. The equinox (21st of March) is used as it provides the best date to prepare shadow cast plots as it gives an average level of shadowing. Winter time shadow plots are of limited value as the sun is very low and casts long shadows. Similarly, summertime plots give the best case causing minimum shadowing due to the suns position which can provide an unfair advantage for new buildings. The following is stated in the BRE Guidance, *"If a space is used all year round, the equinox (21 March) is the best date for which to prepare shadow plots as it gives an average level of shadowing"* and *"As an optional addition, plots for summertime (eg 21 June) may be helpful as they will show the reduced shadowing then, although it should be borne in mind that 21 June represents the best case of minimum shadow, and that shadows for the rest of the year will be longer. Conversely if winter shadows (eg 21 December) are plotted, even low buildings will cast long shadows. In a built-up area, it is common for large areas of the ground to be in shadow in December.*

6 Balscadden Road to 13 Balscadden Road

(A) Light from the Sky – Properties meet the criteria.

(B) Amenity Area Sunlight Analysis – Not assessed as this methodology is used for testing the Proposed Development only.

(C) Loss of Sunlight – All assessed properties meet the criteria.

(D) Average Daylight Factor - Not assessed as this methodology is used for testing the Proposed Development only.

(E) Garden Analysis – Not carried out as Proposed Development is orientated away of these properties. The Proposed Development will have no impact on them.

(F) Overshadowing Assessment – Not carried out as Proposed Development is orientated away of these properties. The Proposed Development will have no impact on them.

Proposed Development

(A) Light from the Sky – Not assessed as this methodology is used for testing the surrounding properties only.

(B) Amenity Area Sunlight Analysis – All amenity areas and public realm are well in excess of the sunlight guidelines.

(C) Loss of Sunlight – Not assessed as this methodology is used for testing the surrounding properties only.

(D) Average Daylight Factor – The development has achieved an overall ADF pass rate of 99%.

(E) Garden Analysis – Not assessed as this methodology is used for testing the surrounding properties only.

(F) Overshadowing Assessment – Not assessed as this methodology is used for testing the surrounding properties only.

14 Conclusion

Overall, the scheme performs very well in terms of daylight/ sunlight performance. All testing criteria applicable to this development has been carried out in line with the relevant standards. In our professional opinion, no further daylight/ sunlight testing is required outside of the scope of this report and the testing methodologies carried out provide enough information to demonstrate this. Testing for both daylight and sunlight impacts and performance have been carried out for surrounding properties and the Proposed Development itself. Please see summary of analysis below;

- Surrounding properties – The impact of the Proposed Development on the surrounding properties has been tested in terms of skylight (See Section 5.1 (A) Light from the Sky), sunlight (See Section 5.3 (C) Loss of Sunlight and Section 5.5 (E) Garden Analysis) and Overshadowing (See Section 5.6 (F) Overshadowing Assessment). Due to lack of information on the surrounding houses regarding windows and gardens, a worst-case approach has been adopted. This analysis indicates that all appropriate testing methodologies as stated in the BRE Guidance have been met.

- Proposed development – ADF testing for every habitable room in the development has been tested, (See Section 5.4 (D) Average Daylight Factor (ADF)). The analysis indicates very high levels of performance when tested against all relevant standards. Any deviation from the standards has been compensated with design measures which ensures a balanced scheme overall while also achieving wider planning objectives. Sunlight availability testing has been carried out in shared and public amenity spaces (See Section 5.2 (B) Amenity Area Sunlight Analysis). The analysis indicates very high levels of sunlight performance in line with relevant standards.

15 Appendix A

Table 10 - Block A ADF Results

Block A - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
First	Block A - L01 - Unit 11 - Bedroom 2	2.1	1	Meets Criteria
	Block A - L01 - Unit 12 - Bedroom 1	3.1	1	Meets Criteria
	Block A - L01 - Unit 12 - Bedroom 2	3.6	1	Meets Criteria
	Block A - L01 - Unit 11 - Bedroom 1	5.1	1	Meets Criteria
Second	Block A - L02 - Unit 12 - Kitchen/ Living/ Dining	3.5	2	Meets Criteria
	Block A - L02 - Unit 11 - Kitchen/ Living/ Dining	3	2	Meets Criteria

Table 11 - Block B Ground Floor ADF Results

Block B - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
Ground	L00 - Unit G1 - Living/ Dining/ Kitchen	3.9	2	Meets Criteria
	L00 - Unit G1 - Bedroom 1	10.6	1	Meets Criteria
	L00 - Unit G1 - Bedroom 2	5	1	Meets Criteria
	L00 - Unit G2 - Bedroom 2	4	1	Meets Criteria
	L00 - Unit G2 - Bedroom 1	3.9	1	Meets Criteria
	L00 - Unit G2 - Liivng/ Dining/ Kitchen	6.9	2	Meets Criteria
	L00 - Unit G4 - Liivng/ Dining/ Kitchen	7	2	Meets Criteria
	L00 - Unit G4 - Bedroom 2	3.1	1	Meets Criteria
	L00 - Unit G4 - Bedroom 1	1.6	1	Meets Criteria
	L00 - Unit G6 - Bedroom 1	1.7	1	Meets Criteria
	L00 - Unit G6 - Bedroom 2	2.9	1	Meets Criteria
	L00 - Unit G6 - Living/ Dining/ Kitchen	10	2	Meets Criteria
	L00 - Unit G3 - Living/ Dining/ Kitchen	2.8	2	Meets Criteria
	L00 - Unit G3 - Bedroom 1	1.6	1	Meets Criteria
	L00 - Unit G5 - Bedroom 1	1.5	1	Meets Criteria
	L00 - Unit G5 - Bedroom 2	1.4	1	Meets Criteria
	L00 - Unit G5 - Living/ Dining/ Kitchen	3.1	2	Meets Criteria
	L00 - Unit G7 - Living/ Dining/ Kitchen	6.7	2	Meets Criteria
	L00 - Unit G7 - Bedroom 2	3	1	Meets Criteria
	L00 - Unit G7 - Bedroom 1	1.4	1	Meets Criteria
	L00 - Unit G9 - Bedroom 1	1.5	1	Meets Criteria
	L00 - Unit G9 - Bedroom 2	3	1	Meets Criteria
	L00 - Unit G9 - Living/ Dining/ Kitchen	4.4	2	Meets Criteria
	L00 - Unit G8 - Living/ Dining/ Kitchen	2.3	2	Meets Criteria
	L00 - Unit G8 - Bedroom 1	1.2	1	Meets Criteria
	L00 - Unit G10 - Bedroom 1	1.9	1	Meets Criteria
	L00 - Unit G10 - Living/ Dining/ Kitchen	3.4	2	Meets Criteria
	L00 - Unit G11 - Living/ Dining/ Kitchen	3.2	2	Meets Criteria
	L00 - Unit G11 - Bedroom 1	2.1	1	Meets Criteria
	L00 - Unit G11 - Bedroom 2	1.8	1	Meets Criteria
	L00 - Unit G12 - Bedroom 2	1.9	1	Meets Criteria
	L00 - Unit G12 - Bedroom 1	2	1	Meets Criteria
	L00 - Unit G12 - Living/ Dining/ Kitchen	3.2	2	Meets Criteria
	L00 - Unit G13 - Living/ Dining/ Kitchen	3.4	2	Meets Criteria
	L00 - Unit G13 - Bedroom 1	1.7	1	Meets Criteria
	L00 - Unit G15 - Bedroom 1	1.4	1	Meets Criteria
	L00 - Unit G15 - Living/ Dining/ Kitchen	2.4	2	Meets Criteria
	L00 - Unit G14 - Living/ Dining/ Kitchen	4.7	2	Meets Criteria
	L00 - Unit G14 - Bedroom 2	3.3	1	Meets Criteria
	L00 - Unit G14 - Bedroom 1	1.4	1	Meets Criteria
	L00 - Unit G16 - Bedroom 1	1.5	1	Meets Criteria
	L00 - Unit G16 - Bedroom 2	3.2	1	Meets Criteria
	L00 - Unit G16 - Living/ Dining/ Kitchen	5.4	2	Meets Criteria

Ground	L00 - Unit G17 - Living/ Dining/ Kitchen	5.1	2	Meets Criteria
	L00 - Unit G17 - Bedroom 1	4.5	1	Meets Criteria
	L00 - Unit G18 - Bedroom 1	1.1	1	Meets Criteria
	L00 - Unit G18 - Living/ Dining/ Kitchen	3	2	Meets Criteria
	L00 - Unit G20 - Living/ Dining/ Kitchen	4.6	2	Meets Criteria
	L00 - Unit G20 - Bedroom 2	3.1	1	Meets Criteria
	L00 - Unit G20 - Bedroom 1	1.5	1	Meets Criteria
	L00 - Unit G19 - Bedroom 1	3.5	1	Meets Criteria
	L00 - Unit G19 - Bedroom 2	1.7	1	Meets Criteria
	L00 - Unit G19 - Bedroom 3	1.5	1	Meets Criteria
	L00 - Unit G19 - Living/ Dining/ Kitchen	3.7	2	Meets Criteria
	L00 - Unit G23 - Living/ Dining/ Kitchen	3.4	2	Meets Criteria
	L00 - Unit G23 - Bedroom 1	2.1	1	Meets Criteria
	L00 - Unit G25 - Bedroom 2	1.7	1	Meets Criteria
	L00 - Unit G24 - Bedroom 2	3.7	1	Meets Criteria
	L00 - Unit G24 - Bedroom 1	1.4	1	Meets Criteria
	L00 - Unit G24 - Living/ Dining/ Kitchen	4.6	2	Meets Criteria
	L00 - Unit G26 - Living/ Dining/ Kitchen	4.9	2	Meets Criteria
	L00 - Unit G26 - Bedroom 2	1.2	1	Meets Criteria
	L00 - Unit G26 - Bedroom 1	6.2	1	Meets Criteria
	L00 - Unit G25 - Bedroom 1	1	1	Meets Criteria
	L00 - Unit G25 - Bedroom 3	0.9	1	Below Criteria
	L00 - Unit G25 - Living/ Dining/ Kitchen	2	2	Meets Criteria
	L00 - Unit G27 - Living/ Dining/ Kitchen	1	2	Below Criteria
	L00 - Unit G27 - Bedroom1	1.7	1	Meets Criteria
	L00 - Unit G27 - Bedroom 3	1.7	1	Meets Criteria
	L00 - Unit G27 - Bedroom 2	1.3	1	Meets Criteria
	L00 - Unit G29 - Bedroom 2	1.1	1	Meets Criteria
	L00 - Unit G29 - Bedroom 1	1.1	1	Meets Criteria
	L00 - Unit G29 - Living/ Dining/ Kitchen	2.7	2	Meets Criteria
	L00 - Unit G31 - Living/ Dining/ Kitchen	2.7	2	Meets Criteria
	L00 - Unit G31 - Bedroom 2	1.1	1	Meets Criteria
	L00 - Unit G33 - Bedroom 2	1.2	1	Meets Criteria
	L00 - Unit G33 - Bedroom 1	1.1	1	Meets Criteria
	L00 - Unit G33 - Living/ Dining/ Kitchen	2.2	2	Meets Criteria
	L00 - Unit G32 - Living/ Dining/ Kitchen	5.9	2	Meets Criteria
	L00 - Unit G32 - Bedroom 1	1.4	1	Meets Criteria
	L00 - Unit G30 - Bedroom 1	1.4	1	Meets Criteria
	L00 - Unit G30 - Living/ Dining/ Kitchen	3.2	2	Meets Criteria
	L00 - Unit G28 - Living/ Dining/ Kitchen	3.4	2	Meets Criteria
	L00 - Unit G28 - Bedroom 1	1.6	1	Meets Criteria
	L00 - Unit G31 - Bedroom 1	1.1	1	Meets Criteria

Table 12 - Block B First Floor ADF Results

Block B - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
First	L01 - Unit 11 - Living/ Dining/ Kitchen	4.1	2	Meets Criteria
	L01 - Unit 11 - Bedroom 1	9.9	1	Meets Criteria
	L01 - Unit 11 - Bedroom 2	4.6	1	Meets Criteria
	L01 - Unit 12 - Bedroom 2	4.5	1	Meets Criteria
	L01 - Unit 12 - Bedroom 1	3.9	1	Meets Criteria
	L01 - Unit 12 - Liivng/ Dining/ Kitchen	6.7	2	Meets Criteria
	L01 - Unit 14 - Liivng/ Dining/ Kitchen	6.3	2	Meets Criteria
	L01 - Unit 14 - Bedroom 2	2.5	1	Meets Criteria
	L01 - Unit 14 - Bedroom 1	1.3	1	Meets Criteria
	L01 - Unit 16 - Bedroom 1	1.4	1	Meets Criteria
	L01 - Unit 16 - Bedroom 2	2.3	1	Meets Criteria
	L01 - Unit 16 - Living/ Dining/ Kitchen	9.1	2	Meets Criteria
	L01 - Unit 13 - Living/ Dining/ Kitchen	2.7	2	Meets Criteria
	L01 - Unit 13 - Bedroom 1	1.3	1	Meets Criteria
	L01 - Unit 15 - Bedroom 2	1.7	1	Meets Criteria
	L01 - Unit 15 - Bedroom 3	1.3	1	Meets Criteria
	L01 - Unit 15 - Living/ Dining/ Kitchen	3.1	2	Meets Criteria
	L01 - Unit 17 - Living/ Dining/ Kitchen	5.7	2	Meets Criteria
	L01 - Unit 17 - Bedroom 2	2.5	1	Meets Criteria
	L01 - Unit 17 - Bedroom 1	1.2	1	Meets Criteria
	L01 - Unit 19 - Bedroom 1	1.3	1	Meets Criteria
	L01 - Unit 19 - Bedroom 2	2.5	1	Meets Criteria
	L01 - Unit 19 - Living/ Dining/ Kitchen	4.0	2	Meets Criteria
	L01 - Unit 18 - Living/ Dining/ Kitchen	2.4	2	Meets Criteria
	L01 - Unit 18 - Bedroom 1	1.0	1	Meets Criteria
	L01 - Unit 110 - Bedroom 1	1.8	1	Meets Criteria
	L01 - Unit 110 - Living/ Dining/ Kitchen	3.4	2	Meets Criteria
	L01 - Unit 111 - Living/ Dining/ Kitchen	3.1	2	Meets Criteria
	L01 - Unit 111 - Bedroom 1	2.1	1	Meets Criteria
	L01 - Unit 111 - Bedroom 2	1.8	1	Meets Criteria
	L01 - Unit 112 - Bedroom 2	1.8	1	Meets Criteria
	L01 - Unit 112 - Bedroom 1	2.0	1	Meets Criteria
	L01 - Unit 112 - Living/ Dining/ Kitchen	3.1	2	Meets Criteria
	L01 - Unit 113 - Living/ Dining/ Kitchen	3.4	2	Meets Criteria
	L01 - Unit 113 - Bedroom 1	1.6	1	Meets Criteria
	L01 - Unit 115 - Bedroom 1	1.3	1	Meets Criteria
	L01 - Unit 115 - Living/ Dining/ Kitchen	2.5	2	Meets Criteria
	L01 - Unit 114 - Living/ Dining/ Kitchen	4.4	2	Meets Criteria
	L01 - Unit 114 - Bedroom 2	2.9	1	Meets Criteria
	L01 - Unit 114 - Bedroom 1	1.2	1	Meets Criteria
	L01 - Unit 116 - Bedroom 1	1.4	1	Meets Criteria
	L01 - Unit 116 - Bedroom 2	2.9	1	Meets Criteria
	L01 - Unit 116 - Living/ Dining/ Kitchen	5.1	2	Meets Criteria
	L01 - Unit 117 - Living/ Dining/ Kitchen	4.6	2	Meets Criteria
	L01 - Unit 117 - Bedroom 1	4.3	1	Meets Criteria
	L01 - Unit 118 - Bedroom 1	1.5	1	Meets Criteria
	L01 - Unit 118 - Living/ Dining/ Kitchen	2.7	2	Meets Criteria
	L01 - Unit 120 - Living/ Dining/ Kitchen	3.0	2	Meets Criteria
	L01 - Unit 120 - Bedroom 2	2.5	1	Meets Criteria

First	L01 - Unit 120 - Bedroom 1	1.2	1	Meets Criteria
	L01 - Unit 119 - Bedroom 1	3.6	1	Meets Criteria
	L01 - Unit 119 - Bedroom 2	2.0	1	Meets Criteria
	L01 - Unit 119 - Bedroom 3	1.4	1	Meets Criteria
	L01 - Unit 119 - Living/ Dining/ Kitchen	3.6	2	Meets Criteria
	L01 - Unit 123 - Living/ Dining/ Kitchen	3.3	2	Meets Criteria
	L01 - Unit 123 - Bedroom 1	1.6	1	Meets Criteria
	L01 - Unit 125 - Bedroom 2	1.2	1	Meets Criteria
	L01 - Unit 124 - Bedroom 2	3.0	1	Meets Criteria
	L01 - Unit 124 - Bedroom 1	1.1	1	Meets Criteria
	L01 - Unit 124 - Living/ Dining/ Kitchen	4.0	2	Meets Criteria
	L01 - Unit 126 - Living/ Dining/ Kitchen	4.4	2	Meets Criteria
	L01 - Unit 126 - Bedroom 2	1.1	1	Meets Criteria
	L01 - Unit 126 - Bedroom 1	6.1	1	Meets Criteria
	L01 - Unit 125 - Bedroom 1	1.3	1	Meets Criteria
	L01 - Unit 125 - Bedroom 3	1.2	1	Meets Criteria
	L01 - Unit 125 - Living/ Dining/ Kitchen	2.0	2	Meets Criteria
	L01 - Unit 127 - Living/ Dining/ Kitchen	1.3	2	Below Criteria
	L01 - Unit 127 - Bedroom1	1.6	1	Meets Criteria
	L01 - Unit 127 - Bedroom 3	1.5	1	Meets Criteria
	L01 - Unit 127 - Bedroom 2	1.2	1	Meets Criteria
	L01 - Unit 129 - Bedroom 2	1.3	1	Meets Criteria
	L01 - Unit 129 - Bedroom 1	1.3	1	Meets Criteria
	L01 - Unit 129 - Living/ Dining/ Kitchen	2.9	2	Meets Criteria
	L01 - Unit 131 - Living/ Dining/ Kitchen	2.9	2	Meets Criteria
	L01 - Unit 131 - Bedroom 2	1.3	1	Meets Criteria
	L01 - Unit 133 - Bedroom 2	1.3	1	Meets Criteria
	L01 - Unit 133 - Bedroom 1	1.2	1	Meets Criteria
	L01 - Unit 133 - Living/ Dining/ Kitchen	3.2	2	Meets Criteria
	L01 - Unit 132 - Living/ Dining/ Kitchen	5.6	2	Meets Criteria
	L01 - Unit 132 - Bedroom 1	1.3	1	Meets Criteria
	L01 - Unit 130 - Bedroom 1	1.3	1	Meets Criteria
	L01 - Unit 130 - Living/ Dining/ Kitchen	3.1	2	Meets Criteria
	L01 - Unit 128 - Living/ Dining/ Kitchen	3.3	2	Meets Criteria
	L01 - Unit 128 - Bedroom 1	1.3	1	Meets Criteria
	L01 - Unit 131 - Bedroom 1	1.3	1	Meets Criteria
	L01 - Unit 121 - Bedroom 1	1.4	1	Meets Criteria
	L01 - Unit 121 - Living/ Dining/ Kitchen	3.1	2	Meets Criteria
	L01 - Unit 122 - Living/ Dining/ Kitchen	2.5	2	Meets Criteria
	L01 - Unit 122 - Bedroom 2	2.6	1	Meets Criteria
	L01 - Unit 122 - Bedroom 1	5.3	1	Meets Criteria
	L01 - Unit 134 - Living/ Dining/ Kitchen	2.2	2	Meets Criteria
	L01 - Unit 134 - Bedroom 2	2.4	1	Meets Criteria
	L01 - Unit 134 - Bedroom 1	2.5	1	Meets Criteria
	L01 - Unit 134 - Bedroom 3	8.1	1	Meets Criteria
	L01 - Unit 15 - Bedroom 1	3.6	1	Meets Criteria

Table 13 - Block B Second Floor ADF Results

Block B - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
Second	L02 - Unit 21 - Living/ Dining/ Kitchen	3.9	2	Meets Criteria
	L02 - Unit 21 - Bedroom 1	9.4	1	Meets Criteria
	L02 - Unit 21 - Bedroom 2	4	1	Meets Criteria
	L02 - Unit 22 - Bedroom 2	5.3	1	Meets Criteria
	L02 - Unit 22 - Bedroom 1	4.4	1	Meets Criteria
	L02 - Unit 22 - Liivng/ Dining/ Kitchen	7.2	2	Meets Criteria
	L02 - Unit 24 - Liivng/ Dining/ Kitchen	5.5	2	Meets Criteria
	L02 - Unit 24 - Bedroom 2	2.4	1	Meets Criteria
	L02 - Unit 24 - Bedroom 1	1.3	1	Meets Criteria
	L02 - Unit 26 - Bedroom 1	1.3	1	Meets Criteria
	L02 - Unit 26 - Bedroom 2	2.2	1	Meets Criteria
	L02 - Unit 26 - Living/ Dining/ Kitchen	8.6	2	Meets Criteria
	L02 - Unit 23 - Living/ Dining/ Kitchen	2.9	2	Meets Criteria
	L02 - Unit 23 - Bedroom 1	1.5	1	Meets Criteria
	L02 - Unit 25 - Bedroom 2	2	1	Meets Criteria
	L02 - Unit 25 - Bedroom 3	1.6	1	Meets Criteria
	L02 - Unit 25 - Living/ Dining/ Kitchen	3.4	2	Meets Criteria
	L02 - Unit 29 - Bedroom 1	1.2	1	Meets Criteria
	L02 - Unit 29 - Bedroom 2	2.4	1	Meets Criteria
	L02 - Unit 29 - Living/ Dining/ Kitchen	5.5	2	Meets Criteria
	L02 - Unit 28 - Living/ Dining/ Kitchen	2.9	2	Meets Criteria
	L02 - Unit 28 - Bedroom 1	1.1	1	Meets Criteria
	L02 - Unit 210 - Bedroom 1	2	1	Meets Criteria
	L02 - Unit 210 - Living/ Dining/ Kitchen	3.7	2	Meets Criteria
	L02 - Unit 211 - Living/ Dining/ Kitchen	3.2	2	Meets Criteria
	L02 - Unit 211 - Bedroom 1	2.3	1	Meets Criteria
	L02 - Unit 211 - Bedroom 2	2	1	Meets Criteria
	L02 - Unit 212 - Bedroom 2	2.1	1	Meets Criteria
	L02 - Unit 212 - Bedroom 1	2.2	1	Meets Criteria
	L02 - Unit 212 - Living/ Dining/ Kitchen	3.2	2	Meets Criteria
	L02 - Unit 213 - Living/ Dining/ Kitchen	3.6	2	Meets Criteria
	L02 - Unit 213 - Bedroom 1	1.8	1	Meets Criteria
	L02 - Unit 215 - Bedroom 1	1.3	1	Meets Criteria
	L02 - Unit 215 - Living/ Dining/ Kitchen	2.8	2	Meets Criteria
	L02 - Unit 214 - Living/ Dining/ Kitchen	4.2	2	Meets Criteria
	L02 - Unit 214 - Bedroom 2	2.8	1	Meets Criteria
	L02 - Unit 214 - Bedroom 1	1.2	1	Meets Criteria
	L02 - Unit 216 - Bedroom 1	1.3	1	Meets Criteria
	L02 - Unit 216 - Bedroom 2	2.8	1	Meets Criteria
	L02 - Unit 216 - Living/ Dining/ Kitchen	5.1	2	Meets Criteria
	L02 - Unit 217 - Living/ Dining/ Kitchen	4.9	2	Meets Criteria
	L02 - Unit 217 - Bedroom 1	3.9	1	Meets Criteria
	L02 - Unit 218 - Bedroom 1	1.7	1	Meets Criteria
	L02 - Unit 218 - Living/ Dining/ Kitchen	3.5	2	Meets Criteria
	L02 - Unit 220 - Living/ Dining/ Kitchen	3	2	Meets Criteria
	L02 - Unit 220 - Bedroom 2	2.4	1	Meets Criteria
	L02 - Unit 220 - Bedroom 1	1.2	1	Meets Criteria
	L02 - Unit 219 - Bedroom 1	4.1	1	Meets Criteria
	L02 - Unit 219 - Bedroom 2	2.4	1	Meets Criteria

Second	L02 - Unit 219 - Bedroom 3	1.7	1	Meets Criteria
	L02 - Unit 219 - Living/ Dining/ Kitchen	4	2	Meets Criteria
	L02 - Unit 223 - Living/ Dining/ Kitchen	3.5	2	Meets Criteria
	L02 - Unit 223 - Bedroom 1	1.7	1	Meets Criteria
	L02 - Unit 225 - Bedroom 2	1.3	1	Meets Criteria
	L02 - Unit 224 - Bedroom 2	2.9	1	Meets Criteria
	L02 - Unit 224 - Bedroom 1	1.1	1	Meets Criteria
	L02 - Unit 224 - Living/ Dining/ Kitchen	4	2	Meets Criteria
	L02 - Unit 226 - Living/ Dining/ Kitchen	4.4	2	Meets Criteria
	L02 - Unit 226 - Bedroom 2	1.3	1	Meets Criteria
	L02 - Unit 226 - Bedroom 1	6.8	1	Meets Criteria
	L02 - Unit 225 - Bedroom 1	1.5	1	Meets Criteria
	L02 - Unit 225 - Bedroom 3	1.4	1	Meets Criteria
	L02 - Unit 225 - Living/ Dining/ Kitchen	2	2	Meets Criteria
	L02 - Unit 227 - Living/ Dining/ Kitchen	1.9	2	Below Criteria
	L02 - Unit 227 - Bedroom1	1.6	1	Meets Criteria
	L02 - Unit 227 - Bedroom 3	1.6	1	Meets Criteria
	L02 - Unit 227 - Bedroom 2	1.2	1	Meets Criteria
	L02 - Unit 229 - Bedroom 2	1.7	1	Meets Criteria
	L02 - Unit 229 - Bedroom 1	1.8	1	Meets Criteria
	L02 - Unit 229 - Living/ Dining/ Kitchen	3.5	2	Meets Criteria
	L02 - Unit 231 - Living/ Dining/ Kitchen	3.5	2	Meets Criteria
	L02 - Unit 231 - Bedroom 2	1.7	1	Meets Criteria
	L02 - Unit 232 - Living/ Dining/ Kitchen	5.7	2	Meets Criteria
	L02 - Unit 232 - Bedroom 1	1.3	1	Meets Criteria
	L02 - Unit 230 - Bedroom 1	1.6	1	Meets Criteria
	L02 - Unit 230 - Living/ Dining/ Kitchen	3.4	2	Meets Criteria
	L02 - Unit 228 - Living/ Dining/ Kitchen	3.5	2	Meets Criteria
	L02 - Unit 228 - Bedroom 1	1.5	1	Meets Criteria
	L02 - Unit 231 - Bedroom 1	1.8	1	Meets Criteria
	L02 - Unit 221 - Bedroom 1	1.6	1	Meets Criteria
	L02 - Unit 221 - Living/ Dining/ Kitchen	3.3	2	Meets Criteria
	L02 - Unit 222 - Living/ Dining/ Kitchen	2.5	2	Meets Criteria
	L02 - Unit 222 - Bedroom 2	2.6	1	Meets Criteria
	L02 - Unit 222 - Bedroom 1	5.4	1	Meets Criteria
	L02 - Unit 234 - Bedroom 1	7.3	1	Meets Criteria
	L02 - Unit 235 - Bedroom 2	3.7	1	Meets Criteria
	L02 - Unit 235 - Bedroom 1	3.4	1	Meets Criteria
	L02 - Unit 233 - Bedroom 1	1.3	1	Meets Criteria
	L02 - Unit 234 - Living/ Dining/ Kitchen	4.2	2	Meets Criteria
	L02 - Unit 233 - Living/ Dining/ Kitchen	3.2	2	Meets Criteria
	L02 - Unit 233 - Bedroom 2	1.4	1	Meets Criteria
	L02 - Unit 235 - Living/ Dining/ Kitchen	5.4	2	Meets Criteria
	L02 - Unit 25 - Bedroom 1	3.8	1	Meets Criteria

Table 14 - Block B Third Floor ADF Results

Block B - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
Third	L03 - Unit 32 - Bedroom 2	5.4	1	Meets Criteria
	L03 - Unit 32 - Bedroom 1	4.4	1	Meets Criteria
	L03 - Unit 32 - Liivng/ Dining/ Kitchen	7.2	2	Meets Criteria
	L03 - Unit 33 - Living/ Dining/ Kitchen	3	2	Meets Criteria
	L03 - Unit 33 - Bedroom 1	1.7	1	Meets Criteria
	L03 - Unit 35 - Bedroom 2	2.2	1	Meets Criteria
	L03 - Unit 35 - Bedroom 3	1.8	1	Meets Criteria
	L03 - Unit 35 - Living/ Dining/ Kitchen	3.5	2	Meets Criteria
	L03 - Unit 38 - Living/ Dining/ Kitchen	3.6	2	Meets Criteria
	L03 - Unit 38 - Bedroom 1	1.6	1	Meets Criteria
	L03 - Unit 320 - Living/ Dining/ Kitchen	2.9	2	Meets Criteria
	L03 - Unit 320 - Bedroom 2	2.4	1	Meets Criteria
	L03 - Unit 320 - Bedroom 1	1.2	1	Meets Criteria
	L03 - Unit 319 - Bedroom 1	4.1	1	Meets Criteria
	L03 - Unit 319 - Bedroom 2	2.4	1	Meets Criteria
	L03 - Unit 319 - Bedroom 3	1.8	1	Meets Criteria
	L03 - Unit 319 - Living/ Dining/ Kitchen	4	2	Meets Criteria
	L03 - Unit 323 - Living/ Dining/ Kitchen	3.5	2	Meets Criteria
	L03 - Unit 323 - Bedroom 1	2.2	1	Meets Criteria
	L03 - Unit 325 - Bedroom 2	1.8	1	Meets Criteria
	L03 - Unit 324 - Bedroom 2	2.9	1	Meets Criteria
	L03 - Unit 324 - Bedroom 1	1.1	1	Meets Criteria
	L03 - Unit 324 - Living/ Dining/ Kitchen	3.9	2	Meets Criteria
	L03 - Unit 326 - Living/ Dining/ Kitchen	4.1	2	Meets Criteria
	L03 - Unit 326 - Bedroom 2	1.5	1	Meets Criteria
	L03 - Unit 326 - Bedroom 1	7.4	1	Meets Criteria
	L03 - Unit 325 - Bedroom 1	1.6	1	Meets Criteria
	L03 - Unit 325 - Bedroom 3	1.5	1	Meets Criteria
	L03 - Unit 325 - Living/ Dining/ Kitchen	2	2	Meets Criteria
	L03 - Unit 327 - Living/ Dining/ Kitchen	2.1	2	Meets Criteria
	L03 - Unit 327 - Bedroom1	2.2	1	Meets Criteria
	L03 - Unit 327 - Bedroom 3	2.4	1	Meets Criteria
	L03 - Unit 327 - Bedroom 2	1.6	1	Meets Criteria
	L03 - Unit 329 - Bedroom 2	1.9	1	Meets Criteria
	L03 - Unit 329 - Bedroom 1	1.8	1	Meets Criteria
	L03 - Unit 329 - Living/ Dining/ Kitchen	4.2	2	Meets Criteria
	L03 - Unit 331 - Living/ Dining/ Kitchen	4.2	2	Meets Criteria
	L03 - Unit 331 - Bedroom 2	1.9	1	Meets Criteria
	L03 - Unit 332 - Living/ Dining/ Kitchen	5.8	2	Meets Criteria
	L03 - Unit 332 - Bedroom 1	1.4	1	Meets Criteria
	L03 - Unit 330 - Bedroom 1	2.3	1	Meets Criteria
	L03 - Unit 330 - Living/ Dining/ Kitchen	3.4	2	Meets Criteria
	L03 - Unit 328 - Living/ Dining/ Kitchen	3.5	2	Meets Criteria
	L03 - Unit 328 - Bedroom 1	2	1	Meets Criteria
	L03 - Unit 331 - Bedroom 1	1.8	1	Meets Criteria
	L03 - Unit 35 - Bedroom 1	4	1	Meets Criteria
	L03 - Unit 321 - Bedroom 1	2.1	1	Meets Criteria
	L03 - Unit 321 - Living/ Dining/ Kitchen	3.3	2	Meets Criteria
	L03 - Unit 322 - Living/ Dining/ Kitchen	2.3	2	Meets Criteria

Third	L03 - Unit 322 - Bedroom 2	2.5	1	Meets Criteria
	L03 - Unit 322 - Bedroom 1	5	1	Meets Criteria
	L03 - Unit 334 - Bedroom 1	7.2	1	Meets Criteria
	L03 - Unit 335 - Bedroom 2	4.2	1	Meets Criteria
	L03 - Unit 335 - Bedroom 1	3.9	1	Meets Criteria
	L03 - Unit 333 - Bedroom 1	1.4	1	Meets Criteria
	L03 - Unit 334 - Living/ Dining/ Kitchen	4	2	Meets Criteria
	L03 - Unit 333 - Living/ Dining/ Kitchen	3.7	2	Meets Criteria
	L03 - Unit 333 - Bedroom 2	1.5	1	Meets Criteria
	L03 - Unit 335 - Living/ Dining/ Kitchen	5.6	2	Meets Criteria

Table 15 - Block B Fourth Floor ADF Results

Block B - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
Fourth	L04 - Unit 429 - Bedroom 2	2.3	1	Meets Criteria
	L04 - Unit 429 - Bedroom 1	1.8	1	Meets Criteria
	L04 - Unit 429 - Living/ Dining/ Kitchen	4.4	2	Meets Criteria
	L04 - Unit 431 - Living/ Dining/ Kitchen	4.5	2	Meets Criteria
	L04 - Unit 431 - Bedroom 2	2.3	1	Meets Criteria
	L04 - Unit 432 - Living/ Dining/ Kitchen	5.7	2	Meets Criteria
	L04 - Unit 432 - Bedroom 1	1.6	1	Meets Criteria
	L04 - Unit 431 - Bedroom 1	1.8	1	Meets Criteria
	L04 - Unit 433 - Bedroom 1	0.5	1	Below Criteria
	L04 - Unit 433 - Bedroom 2	2.4	1	Meets Criteria
	L04 - Unit 433 - Bedroom 3	2.2	1	Meets Criteria
	L04 - Unit 433 - Living/ Dining/ Kitchen	3.9	2	Meets Criteria
	L04 - Unit 430 - Living/ Dining/ Kitchen	4.7	2	Meets Criteria
	L04 - Unit 430 - Bedroom 3	7.8	1	Meets Criteria
	L04 - Unit 430 - Bedroom 2	5.6	1	Meets Criteria
	L04 - Unit 428 - Bedroom 2	2.2	1	Meets Criteria
	L04 - Unit 428 - Bedroom 3	1.9	1	Meets Criteria
	L04 - Unit 428 - Living/ Dining/ Kitchen	10.9	2	Meets Criteria
	L04 - Unit 428 - Bedroom 1	1.8	1	Meets Criteria
	L04 - Unit 430 - Bedroom 1	5.2	1	Meets Criteria

Table 16 - Block C Ground and First Floor ADF Results

Block C - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
Ground	L00 - Unit G6 - Bedroom 1	2.9	1	Meets Criteria
	L00 - Unit G1 - Bedroom 1	4.9	1	Meets Criteria
	L00 - Unit G2 - Bedroom 1	3.7	1	Meets Criteria
	L00 - Unit G3 - Bedroom 1	3.8	1	Meets Criteria
	L00 - Unit G4 - Bedroom 1	3.7	1	Meets Criteria
	L00 - Unit G5 - Bedroom 1	3.8	1	Meets Criteria
First	L01 - Unit G6 - Living/ Dining/ Kitchen	2.3	2	Meets Criteria
	L01 - Unit G6 - Bedroom 3	1.8	1	Meets Criteria
	L01 - Unit G6 - Bedroom 2	2.8	1	Meets Criteria
	L01 - Unit 15 - Living/ Dining/ Kitchen	2.3	2	Meets Criteria
	L01 - Unit 14 - Living/ Dining/ Kitchen	3.1	2	Meets Criteria
	L01 - Unit 11 - Living/ Dining/ Kitchen	3.0	2	Meets Criteria
	L01 - Unit 12 - Living/ Dining/ Kitchen	2.8	2	Meets Criteria
	L01 - Unit 15 - Bedroom 1	1.1	1	Meets Criteria
	L01 - Unit 14 - Bedroom 2	4.0	1	Meets Criteria
	L01 - Unit 14 - Bedroom 1	3.4	1	Meets Criteria
	L01 - Unit 13 - Bedroom 1	4.3	1	Meets Criteria
	L01 - Unit 12 - Bedroom 3	3.3	1	Meets Criteria
	L01 - Unit 12 - Bedroom 2	1.0	1	Meets Criteria
	L01 - Unit G1 - Bedroom 2	1.1	1	Meets Criteria
	L01 - Unit G1 - Bedroom 3	1.1	1	Meets Criteria
	L01 - Unit G2 - Bedroom 2	1.0	1	Meets Criteria
	L01 - Unit G3 - Bedroom 2	1.0	1	Meets Criteria
	L01 - Unit G4 - Bedroom 2	1.0	1	Meets Criteria
	L01 - Unit 11 - Bedroom 2	3.7	1	Meets Criteria
	L01 - Unit 13 - Living/ Dining/ Kitchen	2.7	2	Meets Criteria
	L01 - Unit 12 - Bedroom 1	1.1	1	Meets Criteria
	L01 - Unit 11 - Bedroom 1	1.0	1	Meets Criteria
	L01 - Unit G1 - Living/ Dining/ Kitchen	2.1	2	Meets Criteria
	L01 - Unit G2 - Living/ Dining/ Kitchen	2.0	2	Meets Criteria
	L01 - Unit G3 - Living/ Dining/ Kitchen	2.0	2	Meets Criteria
	L01 - Unit G4 - Living/ Dining/ Kitchen	2.0	2	Meets Criteria
	L01 - Unit G5 - Living/ Dining/ Kitchen	2.0	2	Meets Criteria

Table 17 - Block C Second Floor ADF Results

Block C - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
Second	L02 - Unit 24 - Living/ Dining/ Kitchen	3.2	2	Meets Criteria
	L02 - Unit 21 - Living/ Dining/ Kitchen	3.6	2	Meets Criteria
	L02 - Unit 22 - Living/ Dining/ Kitchen	3.4	2	Meets Criteria
	L02 - Unit 24 - Bedroom 2	4.2	1	Meets Criteria
	L02 - Unit 24 - Bedroom 1	3.7	1	Meets Criteria
	L02 - Unit 23 - Bedroom 1	4.5	1	Meets Criteria
	L02 - Unit 22 - Bedroom 3	4.1	1	Meets Criteria
	L02 - Unit 22 - Bedroom 2	1.1	1	Meets Criteria
	L02 - Unit 21 - Bedroom 2	3.9	1	Meets Criteria
	L02 - Unit 23 - Living/ Dining/ Kitchen	2.9	2	Meets Criteria
	L02 - Unit 22 - Bedroom 1	1.3	1	Meets Criteria
	L02 - Unit 21 - Bedroom 1	1.9	1	Meets Criteria
	L02 - Unit 212 - Living/ Dining/ Kitchen	5.5	2	Meets Criteria
	L02 - Unit 212 - Bedroom 2	4.3	1	Meets Criteria
	L02 - Unit 212 - Bedroom 1	3.1	1	Meets Criteria
	L02 - Unit 211 - Bedroom 1	3.2	1	Meets Criteria
	L02 - Unit 211 - Bedroom 2	1.0	1	Meets Criteria
	L02 - Unit 211 - Living/ Dining/ Kitchen	2.0	2	Meets Criteria
	L02 - Unit 29 - Living/ Dining/ Kitchen	2.1	2	Meets Criteria
	L02 - Unit 29 - Bedroom 2	1.0	1	Meets Criteria
	L02 - Unit 29 - Bedroom 1	3.3	1	Meets Criteria
	L02 - Unit 27 - Bedroom 1	3.4	1	Meets Criteria
	L02 - Unit 27 - Bedroom 2	1.0	1	Meets Criteria
	L02 - Unit 27 - Living/ Dining/ Kitchen	2.1	2	Meets Criteria
	L02 - Unit 25 - Living/ Dining/ Kitchen	3.7	2	Meets Criteria
	L02 - Unit 25 - Bedroom 1	1.2	1	Meets Criteria
	L02 - Unit 26 - Living/ Dining/ Kitchen	3.0	2	Meets Criteria
	L02 - Unit 28 - Living/ Dining/ Kitchen	2.7	2	Meets Criteria
	L02 - Unit 210 - Living/ Dining/ Kitchen	4.4	2	Meets Criteria
	L02 - Unit 210 - Bedroom 2	4.5	1	Meets Criteria
	L02 - Unit 210 - Bedroom 1	3.4	1	Meets Criteria
	L02 - Unit 28 - Bedroom 1	4.5	1	Meets Criteria
	L02 - Unit 28 - Bedroom 2	1.1	1	Meets Criteria
	L02 - Unit 26 - Bedroom 1	1.0	1	Meets Criteria
	L02 - Unit 26 - Bedroom 2	1.0	1	Meets Criteria
	L02 - Unit 26 - Bedroom 3	5.2	1	Meets Criteria

Table 18 - Block C Third Floor ADF Results

Block C - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
Third	L03 - Unit 33 - Living/ Dining/ Kitchen	3.3	2	Meets Criteria
	L03 - Unit 31 - Living/ Dining/ Kitchen	4.0	2	Meets Criteria
	L03 - Unit 33 - Bedroom 2	4.3	1	Meets Criteria
	L03 - Unit 33 - Bedroom 1	3.9	1	Meets Criteria
	L03 - Unit 32 - Bedroom 1	4.5	1	Meets Criteria
	L03 - Unit 31 - Bedroom 2	3.9	1	Meets Criteria
	L03 - Unit 32 - Living/ Dining/ Kitchen	3.0	2	Meets Criteria
	L03 - Unit 311 - Living/ Dining/ Kitchen	6.1	2	Meets Criteria
	L03 - Unit 311 - Bedroom 2	4.8	1	Meets Criteria
	L03 - Unit 311 - Bedroom 1	3.6	1	Meets Criteria
	L03 - Unit 310 - Bedroom 1	3.8	1	Meets Criteria
	L03 - Unit 310 - Bedroom 2	1.1	1	Meets Criteria
	L03 - Unit 310 - Living/ Dining/ Kitchen	2.6	2	Meets Criteria
	L03 - Unit 38 - Living/ Dining/ Kitchen	2.6	2	Meets Criteria
	L03 - Unit 38 - Bedroom 2	1.1	1	Meets Criteria
	L03 - Unit 38 - Bedroom 1	3.8	1	Meets Criteria
	L03 - Unit 36 - Bedroom 1	4.0	1	Meets Criteria
	L03 - Unit 36 - Bedroom 2	1.1	1	Meets Criteria
	L03 - Unit 36 - Living/ Dining/ Kitchen	2.6	2	Meets Criteria
	L03 - Unit 34 - Living/ Dining/ Kitchen	4.1	2	Meets Criteria
	L03 - Unit 34 - Bedroom 1	1.3	1	Meets Criteria
	L03 - Unit 35 - Living/ Dining/ Kitchen	3.3	2	Meets Criteria
	L03 - Unit 37 - Living/ Dining/ Kitchen	3.1	2	Meets Criteria
	L03 - Unit 39 - Living/ Dining/ Kitchen	6.1	2	Meets Criteria
	L03 - Unit 39 - Bedroom 2	4.8	1	Meets Criteria
	L03 - Unit 39 - Bedroom 1	3.8	1	Meets Criteria
	L03 - Unit 37 - Bedroom 1	4.8	1	Meets Criteria
	L03 - Unit 37 - Bedroom 2	1.4	1	Meets Criteria
	L03 - Unit 35 - Bedroom 1	1.2	1	Meets Criteria
	L03 - Unit 35 - Bedroom 2	1.0	1	Meets Criteria
	L03 - Unit 35 - Bedroom 3	5.6	1	Meets Criteria
	L03 - Unit 31 - Bedroom 1	2.5	1	Meets Criteria

Table 19 - Block C Fourth Floor ADF Results

Block C - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
Fourth	L04 - Unit 44 - Bedroom 2	4.3	1	Meets Criteria
	L04 - Unit 412 - Living/ Dining/ Kitchen	6.2	2	Meets Criteria
	L04 - Unit 412 - Bedroom 2	4.6	1	Meets Criteria
	L04 - Unit 412 - Bedroom 1	3.5	1	Meets Criteria
	L04 - Unit 411 - Bedroom 1	3.8	1	Meets Criteria
	L04 - Unit 411 - Bedroom 2	1.6	1	Meets Criteria
	L04 - Unit 411 - Living/ Dining/ Kitchen	2.8	2	Meets Criteria
	L04 - Unit 49 - Living/ Dining/ Kitchen	2.9	2	Meets Criteria
	L04 - Unit 49 - Bedroom 2	1.6	1	Meets Criteria
	L04 - Unit 49 - Bedroom 1	3.9	1	Meets Criteria
	L04 - Unit 47 - Bedroom 1	4.0	1	Meets Criteria
	L04 - Unit 47 - Bedroom 2	1.6	1	Meets Criteria
	L04 - Unit 47 - Living/ Dining/ Kitchen	2.9	2	Meets Criteria
	L04 - Unit 45 - Living/ Dining/ Kitchen	4.1	2	Meets Criteria
	L04 - Unit 45 - Bedroom 1	1.6	1	Meets Criteria
	L04 - Unit 46 - Living/ Dining/ Kitchen	3.3	2	Meets Criteria
	L04 - Unit 48 - Living/ Dining/ Kitchen	3.1	2	Meets Criteria
	L04 - Unit 410 - Living/ Dining/ Kitchen	5.9	2	Meets Criteria
	L04 - Unit 410 - Bedroom 2	4.5	1	Meets Criteria
	L04 - Unit 410 - Bedroom 1	3.5	1	Meets Criteria
	L04 - Unit 48 - Bedroom 1	4.6	1	Meets Criteria
	L04 - Unit 48 - Bedroom 2	1.7	1	Meets Criteria
	L04 - Unit 46 - Bedroom 1	1.6	1	Meets Criteria
	L04 - Unit 46 - Bedroom 2	1.5	1	Meets Criteria
	L04 - Unit 46 - Bedroom 3	5.1	1	Meets Criteria
	L04 - Unit 44 - Living/ Dining/ Kitchen	2.3	2	Meets Criteria
	L04 - Unit 44 - Bedroom 1	5.3	1	Meets Criteria

Fourth	L04 - Unit 44 - Bedroom 2	4.3	1	Meets Criteria
	L04 - Unit 412 - Living/ Dining/ Kitchen	6.2	2	Meets Criteria
	L04 - Unit 412 - Bedroom 2	4.6	1	Meets Criteria
	L04 - Unit 412 - Bedroom 1	3.5	1	Meets Criteria
	L04 - Unit 411 - Bedroom 1	3.8	1	Meets Criteria
	L04 - Unit 411 - Bedroom 2	1.6	1	Meets Criteria
	L04 - Unit 411 - Living/ Dining/ Kitchen	2.8	2	Meets Criteria
	L04 - Unit 49 - Living/ Dining/ Kitchen	2.9	2	Meets Criteria
	L04 - Unit 49 - Bedroom 2	1.6	1	Meets Criteria
	L04 - Unit 49 - Bedroom 1	3.9	1	Meets Criteria
	L04 - Unit 47 - Bedroom 1	4.0	1	Meets Criteria
	L04 - Unit 47 - Bedroom 2	1.6	1	Meets Criteria
	L04 - Unit 47 - Living/ Dining/ Kitchen	2.9	2	Meets Criteria
	L04 - Unit 45 - Living/ Dining/ Kitchen	4.1	2	Meets Criteria
	L04 - Unit 45 - Bedroom 1	1.6	1	Meets Criteria
	L04 - Unit 46 - Living/ Dining/ Kitchen	3.3	2	Meets Criteria
	L04 - Unit 48 - Living/ Dining/ Kitchen	3.1	2	Meets Criteria
	L04 - Unit 410 - Living/ Dining/ Kitchen	5.9	2	Meets Criteria
	L04 - Unit 410 - Bedroom 2	4.5	1	Meets Criteria
	L04 - Unit 410 - Bedroom 1	3.5	1	Meets Criteria
	L04 - Unit 48 - Bedroom 1	4.6	1	Meets Criteria
	L04 - Unit 48 - Bedroom 2	1.7	1	Meets Criteria
	L04 - Unit 46 - Bedroom 1	1.6	1	Meets Criteria
	L04 - Unit 46 - Bedroom 2	1.5	1	Meets Criteria
	L04 - Unit 46 - Bedroom 3	5.1	1	Meets Criteria
	L04 - Unit 44 - Living/ Dining/ Kitchen	2.3	2	Meets Criteria
	L04 - Unit 44 - Bedroom 1	5.3	1	Meets Criteria

Table 20 - Block D ADF Results

Block D - Average Daylight Factor				
Floor	Room Name	Average Daylight Factor [%]	BRE Average Daylight Factor Target [%]	Status
First	L01 - Unit 1 - 5 - KLD	2.2	2	Meets Criteria
	L01 - Unit 1 - 2 - Bedroom 2	4.1	1	Meets Criteria
	L01 - Unit 1 - 2 - Bedroom 1	3.2	1	Meets Criteria
	L01 - Unit 1 - 1 - KLD	3.7	2	Meets Criteria
	L01 - Unit 1 - 1 - Bedroom 1	3.3	1	Meets Criteria
	L01 - Unit 1 - 4 - Studio	2	2	Meets Criteria
	L01 - Unit 1 - 2 - KLD	3	2	Meets Criteria
	L01 - Unit 1 - 3 - Studio	2	2	Meets Criteria
	L01 - Unit 1 - 5 - Bedroom 1	2.18	1	Meets Criteria
Second	L02 - Unit 2 - 2 - Bedroom 2	3	1	Meets Criteria
	L02 - Unit 2 - 2 - Bedroom 1	2.4	1	Meets Criteria
	L02 - Unit 2 - 1 - KLD	2.8	2	Meets Criteria
	L02 - Unit 2 - 1 - Bedroom 1	2.5	1	Meets Criteria
	L02 - Unit 2 - 2 - KLD	2.2	2	Meets Criteria
	L02 - Unit 2 - 3 - Studio	2.1	2	Meets Criteria
	L02 - Unit 2 - 4 - Studio	2.1	2	Meets Criteria

16 Appendix B

Figure 52 - Site Plan with Photo References

Figure 53 - Site Photo Number 1

Figure 54 - Site Photo Number 2

Figure 55 - Site Photo Number 3

Figure 56 - Site Photo Number 4

Figure 57 - Site Photo Number 5

Figure 58 - Site Photo Number 6

Figure 59 - Site Photo Number 7

Figure 60 - Site Photo Number 8

Figure 61 - Site Photo Number 9

Figure 62 - Site Photo Number 10

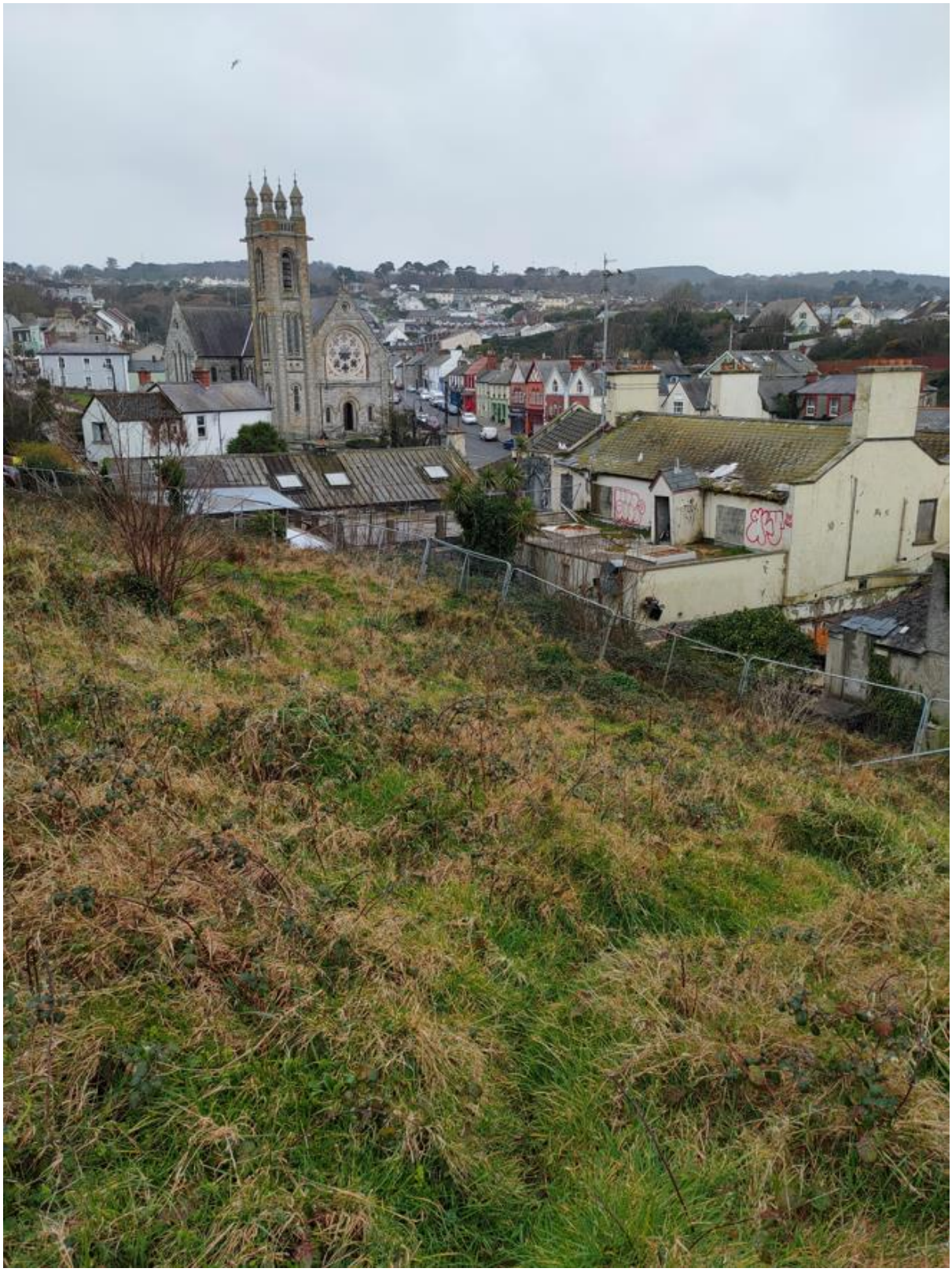

Figure 63 - Site Photo Number 11

Figure 64 - Site Photo Number 12

Figure 65 - Site Photo Number 13